

A Stereo-Atlas of Ostracod Shells

edited by R. H. Bate, J. W. Neale, David J. Siveter and
P. C. Sylvester-Bradley

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Contributions illustrated by scanning electron micrographs of Ostracoda in stereo-pairs are invited. Full instructions may be obtained on request from any one of the Editors or Editorial Board. Format should follow the style set by the majority of papers in this issue. Descriptive matter apart from illustrations should be cut to a minimum; preferably each plate should be accompanied by one page of text only. Blanks to aid in mounting figures for plates may be obtained from the Editors.

Acknowledgements

This Volume of the *Stereo-Atlas* has been aided by generous financial support from Robertson Research International Ltd. and from the Shell International Petroleum Co. Ltd.

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ON *RENIBEYRICHIA MULCIBER* SIVETER gen. et sp. nov.

by David J. Siveter
(University of Leicester, England)

Genus *RENIBEYRICHIA* gen. nov.

Type-species: *Renibeyrichia multiciber* sp. nov.

Derivation of name: Latin *renis*, a kidney, and the generic name *Beyrichia*; with reference to the shape of the crumina. Gender, feminine.

Diagnosis: Coarsely tuberculate beyrichiine with a long crumina, indistinctly set off from the lobes, incorporating all of the anterior lobe up to the cuspidal region, the area of lobal connection and the ventral region of the syllobium. Syllobial groove sharply defined, joined directly to the prenodal sulcus below a prominent, undisturbed zygial arch in both dimorphs. Velar ridge well developed, smooth, entire in tecnomorphs; it can be traced, parallel to the marginal structure, along the base the crumina.

Explanation of Plate 3, 2

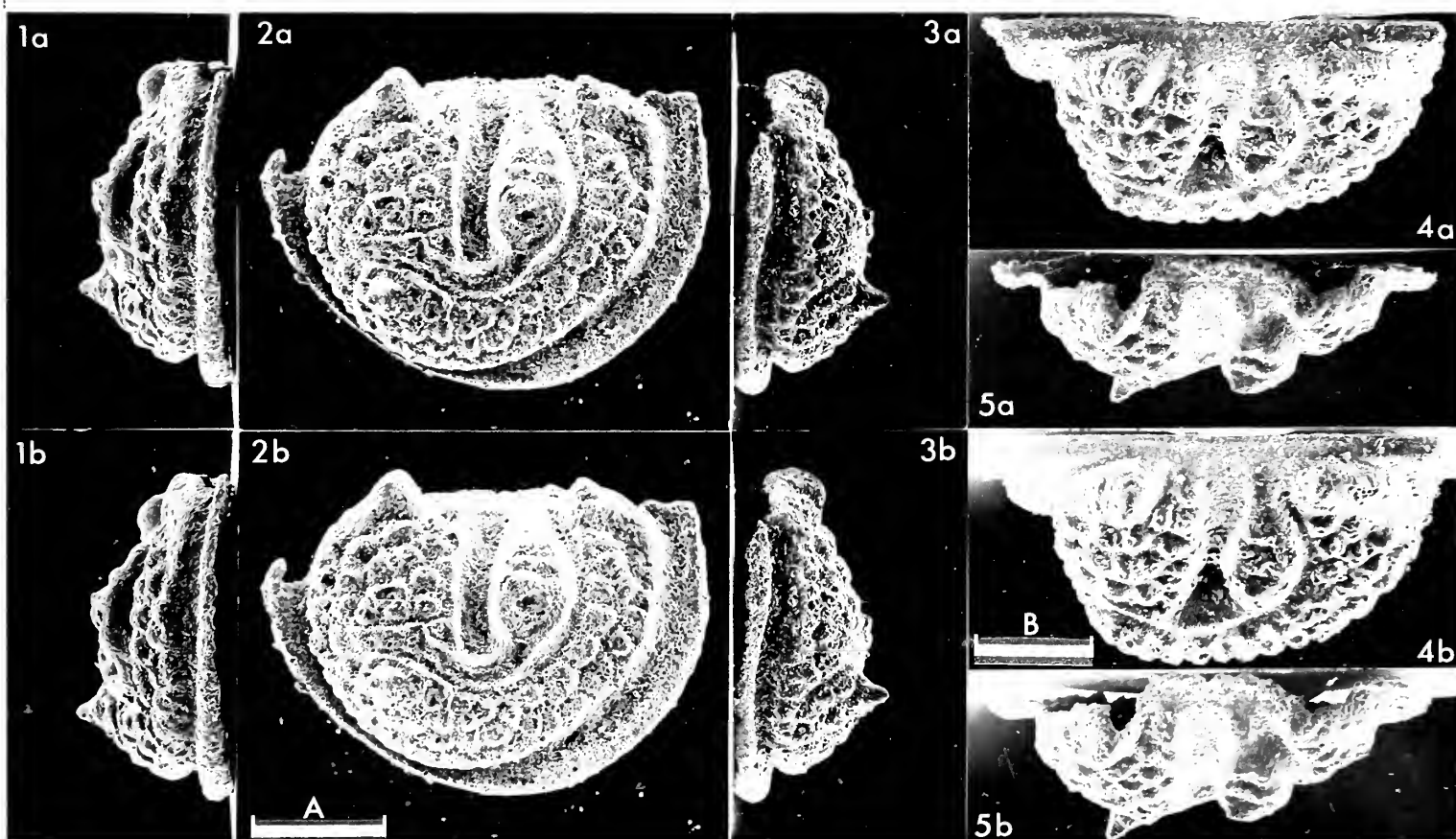
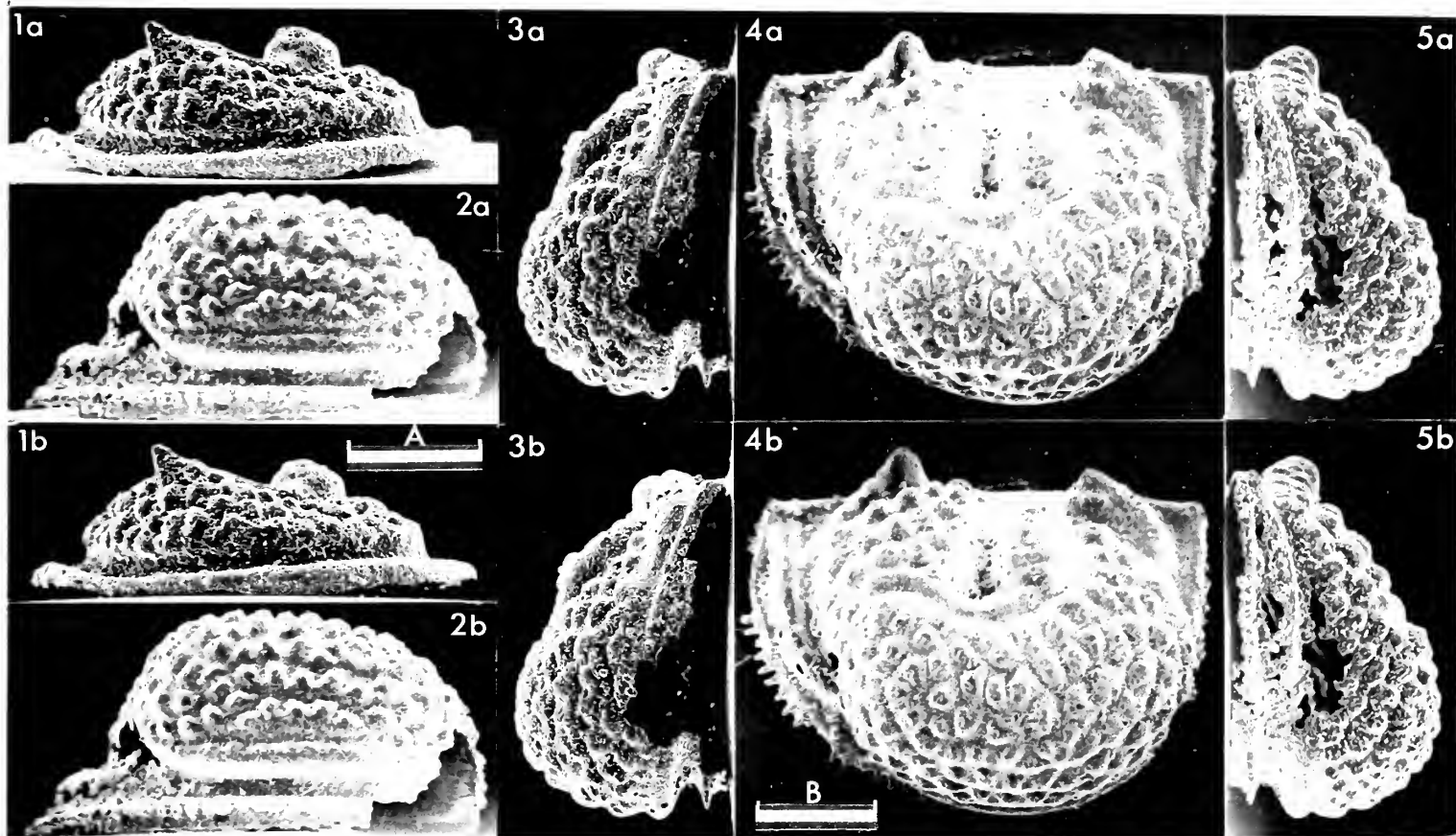
Fig. 1, tecnomorph RV, ext. vent. (OS 6847, 1600 μ m long). Figs. 2-5, ♀ RV (holotype, OS 6848, 1800 μ m long): fig. 2, ext. vent.; fig. 3, ext. ant.; fig. 4, ext. lat.; fig. 5, ext. post.
Scale A (500 μ m; \times 37), fig. 1; scale B (500 μ m; \times 33), figs. 2-5.

Remarks: A combination of the nature of the lobation, ornament and subcruminal morphology allies this species to the subfamily Beyrichiinae Matthew, 1886. As such, however, the overall shape and extent of the crumina is unique. The smooth, almost flange-like velum is also unusual. The incursion of the posterior part of the crumina into syllobial space imitates conditions more normally associated with treposellids.

Renibeyrichia is comparable with *Beyrichia* (*Asperibeyrichia*) Martinsson, 1962, *Beyrichia* (*Scabribeyrichia*) Martinsson, 1962, and *Eobeyrichia* Henningsmoen, 1954 in having a zygial arch in both females and tecnomorphs. As in the beyrichiines *Calcaribeyrichia* Martinsson, 1962, *Plicibeyrichia* Martinsson, 1962, *Gannibeyrichia* Martinsson, 1962 and *Navibeyrichia* Martinsson, 1962, *Renibeyrichia* retains a ridge, rather than the more commonly found finger-print striation (cf. *Beyrichia* M'Coy, 1846), on the ventral part of the crumina. The assimilation within the carapace wall of much of the crumina and the lack of markedly abrupt differentiation between crumina and lobes is a relatively advanced trend known from other beyrichiines (cf. subgenus *Asperibeyrichia*), though the occurrence of an undisturbed zygial arch and fully developed beyrichiacean lobation shows that the Devonian *Renibeyrichia* is not far removed from primitive Silurian members of the subfamily.

Explanation of Plate 3, 4

Fig. 1, tecnomorph RV, ext. ant. (OS 6847); fig. 2, tecnomorph RV, ext. lat. (OS 6847); fig. 3, tecnomorph RV, ext. post. (OS 6847); fig. 4, ♀ RV, ext. dors. (holotype, OS 6848); fig. 5, tecnomorph RV, ext. dors. (OS 6847).
Scale A (500 μ m; \times 37), figs. 1-3, 5; scale B (500 μ m; \times 33), fig. 4.



Renibeyrichia multiciber sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) **OS 6848**, ♀ RV.

Type locality: Left bank of R. Murrumbidgee, at 'Shearsby's Wallpaper', 1100 yd upstream from Old Taemas Bridge, SW of Yass, New South Wales, Australia; approx. lat. 35°0'S, long. 148°50'E; *Spirifer yassensis* Limestone, Murrumbidgee Series, Lower Devonian. Locality 1955/2 of White & Toombs 1972 (*Bull. Br. Mus. nat. Hist. (Geol.)* 22, 411).

Derivation of name: Latin *Mulciber*, god of fire; from resemblance of ornament to volcanoes.

Figured specimens: Brit. Mus. (Nat. Hist.) nos. **OS 6847** (tecnomorph RV: Pl. 3, 2, fig. 1; Pl. 3, 4, figs. 1–3, 5), **OS 6848** (♀ RV: Pl. 3, 2, figs. 2–5; Pl. 3, 4, fig. 4; Pl. 3, 8, figs. 2, 3), **OS 6849** (♀ LV: Pl. 3, 8, fig. 1), **OS 6850** (tecnomorph RV: Pl. 3, 6, figs. 1–4), **OS 6851** (tecnomorph LV: Pl. 3, 8, fig. 4).

All valves silicified, ex-faunal phial **IN 49627**, obtained from Brit. Mus. (Nat. Hist.) *P. murrumbidgeensis* specimen **P. 33583** (see 'Remarks'), from type locality. Rock not *in situ*, collected from scree.

Diagnosis: Anterior lobal cusp and single syllobial cusp stoutly developed above the hinge line, mostly smooth. A prominent calcarine spine. Apex of preadductor node extended to reach the dorsal margin of the valve.

Explanation of Plate 3, 6

Figs. 1–4, tecnomorph RV (**OS 6850**): fig. 1, ext. lat.; fig. 2, syllobial ornament; figs. 3, 4, ornament of anterior lobe. Scale A (500 µm; × 37), fig. 1; scale B (150 µm; × 110), fig. 2; scale C (75 µm; × 275), fig. 3; scale D (25 µm; × 550), fig. 4.

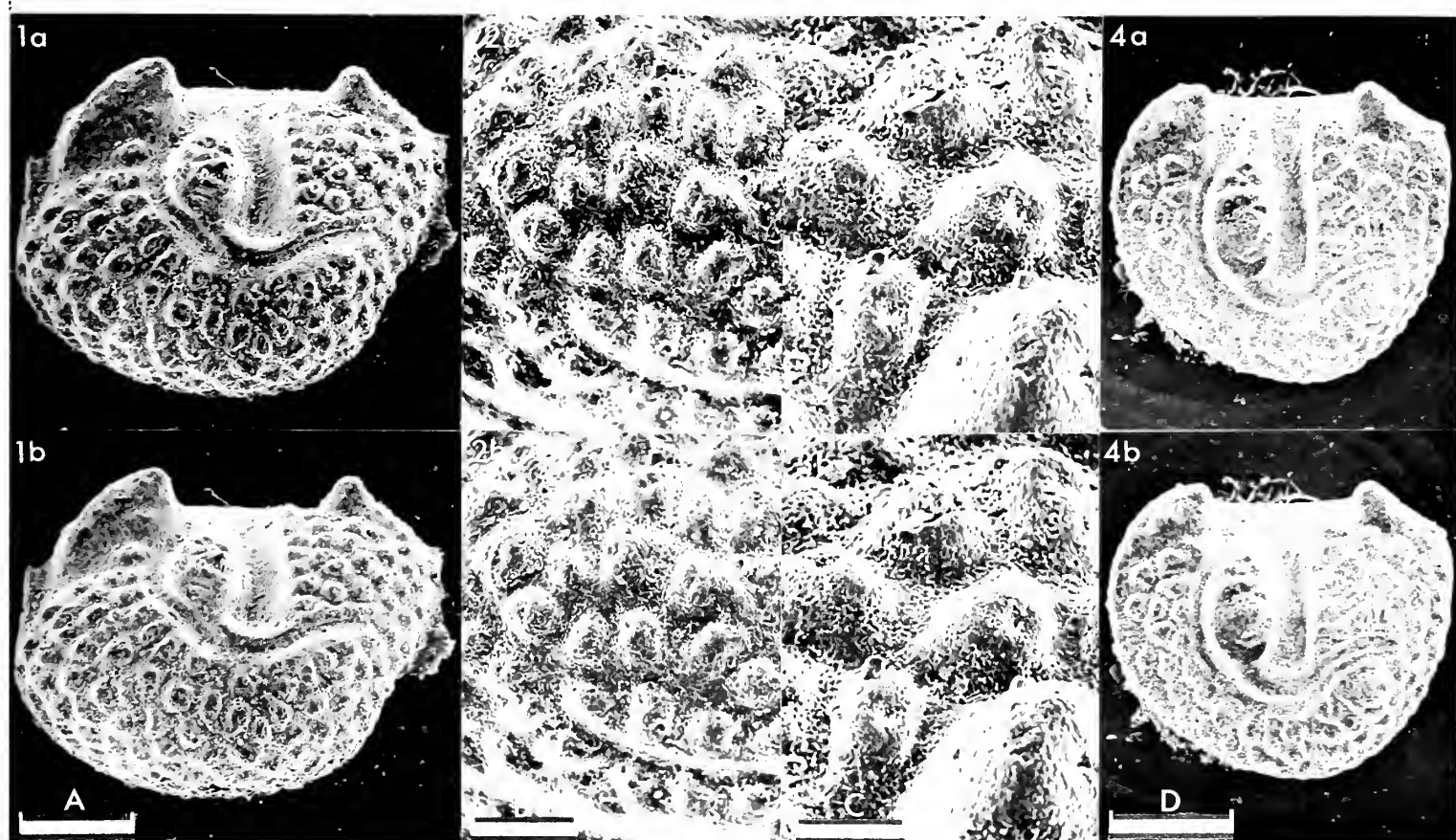
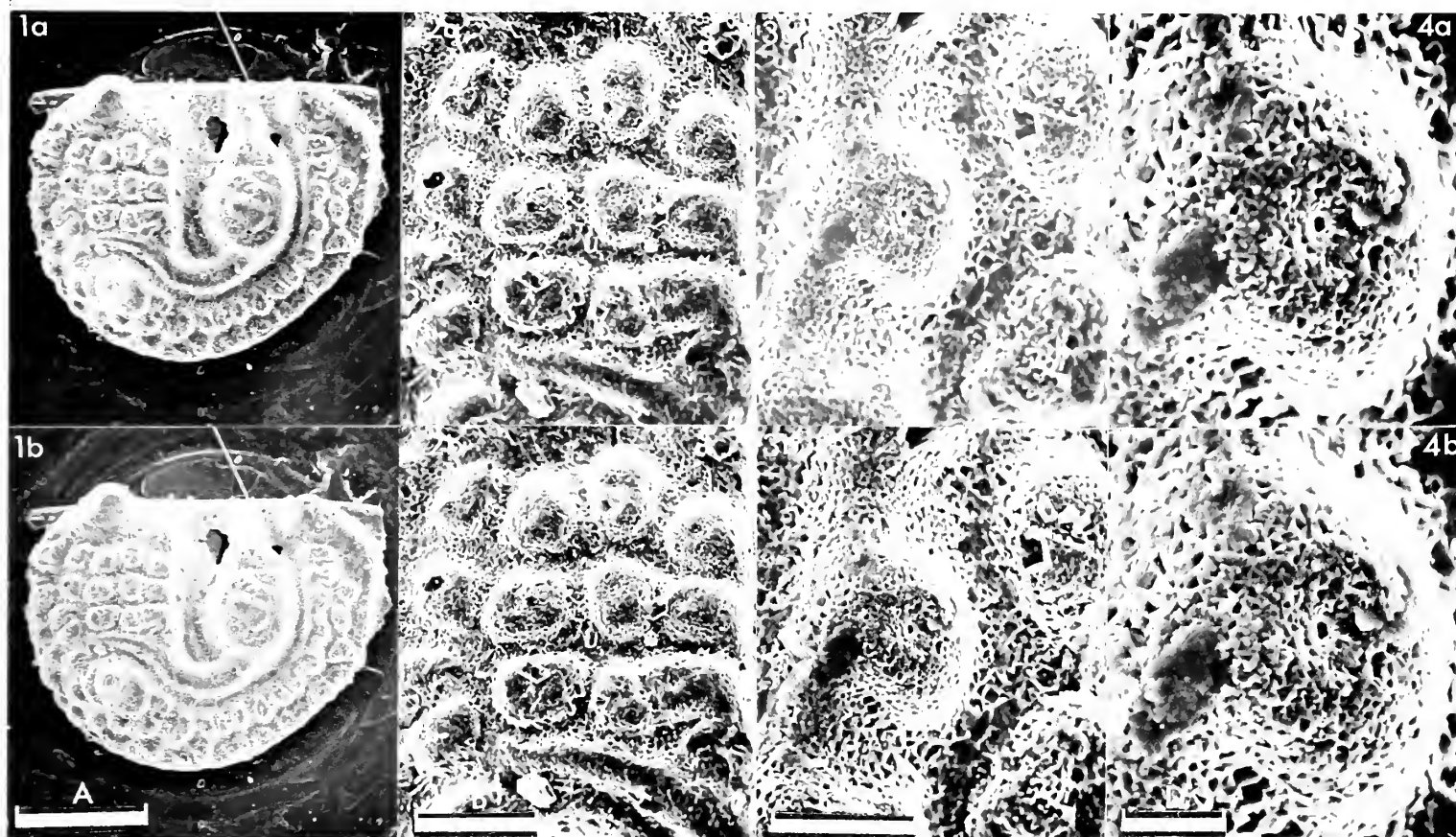
Remarks: *R. multiciber* is described from residues of a collection of Australian buchanosteid arthrodires made by Toombs and others during 1955 and 1963. Some of the arthrodire finds were documented (White & Toombs, op. cit.) as *Parabuchanosteus murrumbidgeensis* (White). Material [Brit. Mus. (Nat. Hist.)] consists of 25 valves, mostly fragmentary: figured specimens; faunal phials **IN 49627**, **IN 49628**; valves in faunal slide collection. There are six females, but no adult tecnomorphs.

A calcarine spine, always developed in tecnomorphs, may be present in females or, more usually, its position recognized by the occurrence of a conspicuous posterodorsal cruminal tubercle. Each tubercle has a single pore. The morphology of the syllobial groove and adjacent zygial arch is similar to that of *Beyrichia* (*Scabibeyrichia*) *churkini* Berdan & Copeland, 1973 (*Prof. Pap. U.S. geol. Surv.* 825) from assumed late Lower Devonian (Emsian) of Alaska and Yukon Territory.

Distribution: Known only from the marine *S. yassensis* Limestone, Murrumbidgee Series, New South Wales; White & Toombs localities 1955/2 (type locality) and 1963/16 (left bank of Murrumbidgee, shore E of mouth of Oakey Creek, 1250 yd upstream of Old Taemas Bridge; fish specimen **P. 50389**). The Murrumbidgee Series (Browne, 1959, *J. Proc. R. Soc. N.S.W.* 92 for 1958) is correlated with supposed upper Lower Devonian (late Siegenian-Emsian) strata in the Wee Jasper area to the W (Pedder, Jackson & Philip, 1970, *J. Paleo.* 44).

Explanation of Plate 3, 8

Fig. 1, ♀ LV, ext. lat. (**OS 6849**); fig. 2, ♀ RV, vent. obl., ventrolateral cruminal ornament (holotype, **OS 6848**); fig. 3, ♀ RV, dors., ornament near syllobial cusp (holotype, **OS 6848**); fig. 4, tecnomorph LV, ext. lat. (**OS 6851**). Scale A (500 µm; × 31), fig. 1; scale B (200 µm; × 75), fig. 2; scale C (100 µm; × 150), fig. 3; scale D (500 µm; × 34), fig. 4.



ON *PHILOMEDES DONZEI* NEALE sp. nov.

by John W. Neale
(University of Hull, England)

Philomedes donzei sp. nov.

1965 *Cypridina?* sp. nov. A; P. Donze, *Trav. Lab. Géol. Univ. Lyon* 12, 100–101, pl. 3, figs. 71–74.

Holotype: University of Hull coll. no. **HU.152.C.1**, ♀ car.

[Paratypes: University of Hull coll. no. **HU.152.C.2**, ♀ LV. University of Lyon coll. nos. **157130**, ♀ car.; **157131**, ♀ car.; **157132**, ♀ LV and associated RV].

Type locality: Chabrières, Alpes-Haute-Provence, France; approx. lat. 44°02'N, long. 6°16'E. From the basal Valanginian of the Vocontian Trough.

Derivation of name: In honour of Dr P. Donze of the University of Lyon.

Figured specimens: University of Hull coll. no. **HU.152.C.1** (♀ car.: Pl. 3, 10, figs. 2, 3). University of Lyon coll. nos. **157130** (♀ car.: Pl. 3, 12, fig. 1), **157131** (♀ car.: Pl. 3, 12, fig. 2), **157132** (♀ LV, RV with musc. sc. pattern: Text-fig. 1); unnumbered specimen (♂ car.: Pl. 3, 10, fig. 1).

Explanation of Plate 3, 10

Fig. 1, ♂ car., ext. lt. lat. (unnumbered specimen, 1065 µm long). Figs. 2, 3, ♀ car. (holotype, **HU.152.C.1**, 1117 µm long): fig. 2, ext. lt. lat.; fig. 3, ext. rt. lat.

Scale A (200 µm; × 60), fig. 1; scale B (200 µm; × 59), figs. 2, 3.

Figured specimens: Unnumbered specimen from locality *c.* 50 m from entrance (contd.) to grounds of Château de Malbos, Berrias-la Rouvière road, France; approx. lat. 44°23'N, long. 4°12'E; basal Valanginian. All other specimens are from the type locality.

Diagnosis: Smooth, thick-shelled. In lateral view female almost equidimensional, male more elongate.

Remarks: Myodocopida are rare in the geological record. This species has a similar muscle scar pattern and the strong sexual dimorphism of *Philomedes* but is heavily calcified suggesting that its swimming ability was more limited than present species of the genus. Specimens of "*Cypridina?* sp. nov. A" figured by Donze (1965) from a similar horizon at Berrias, Ardèche are the males of this species (see Pl. 3, 10, fig. 1).

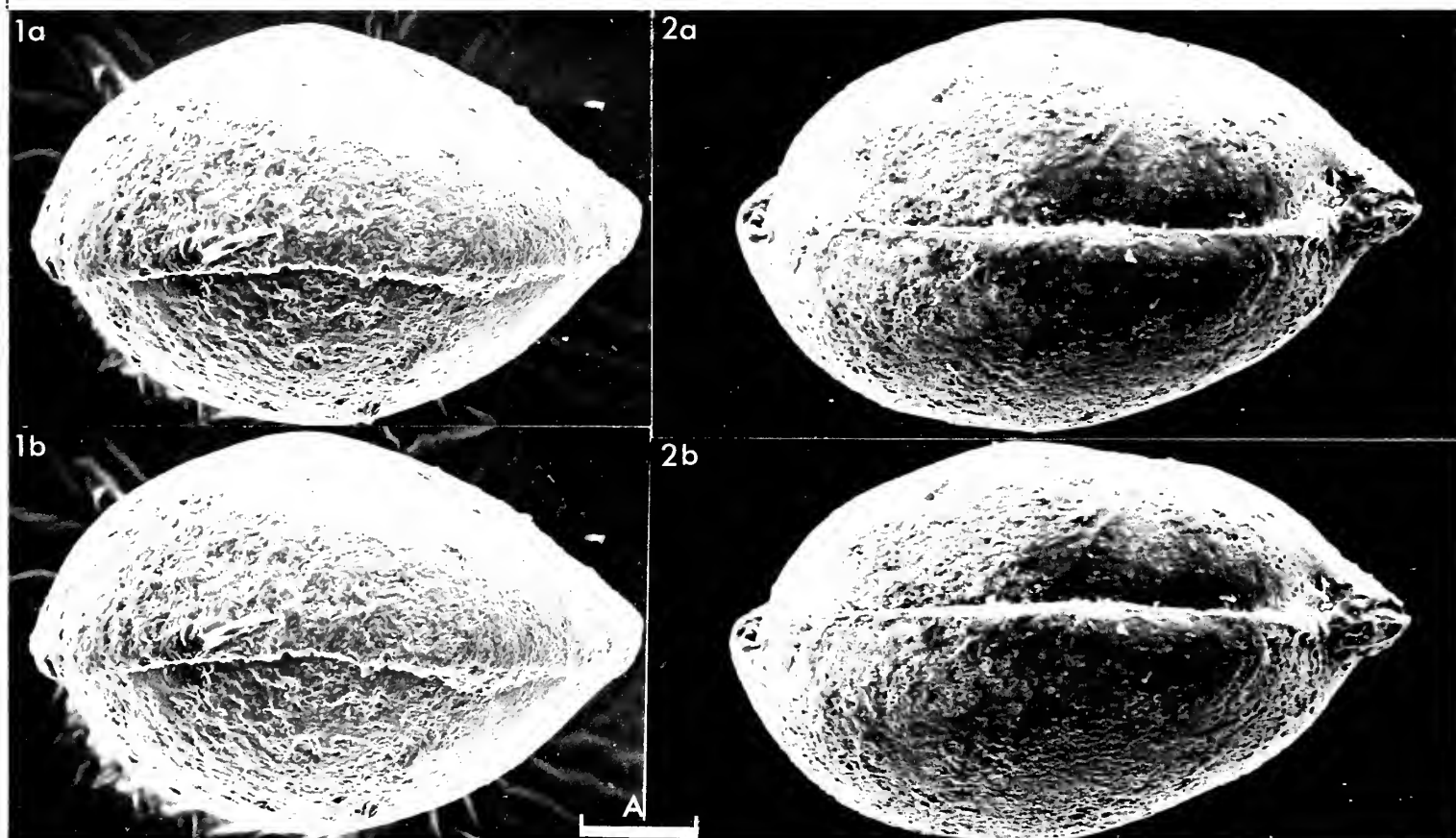
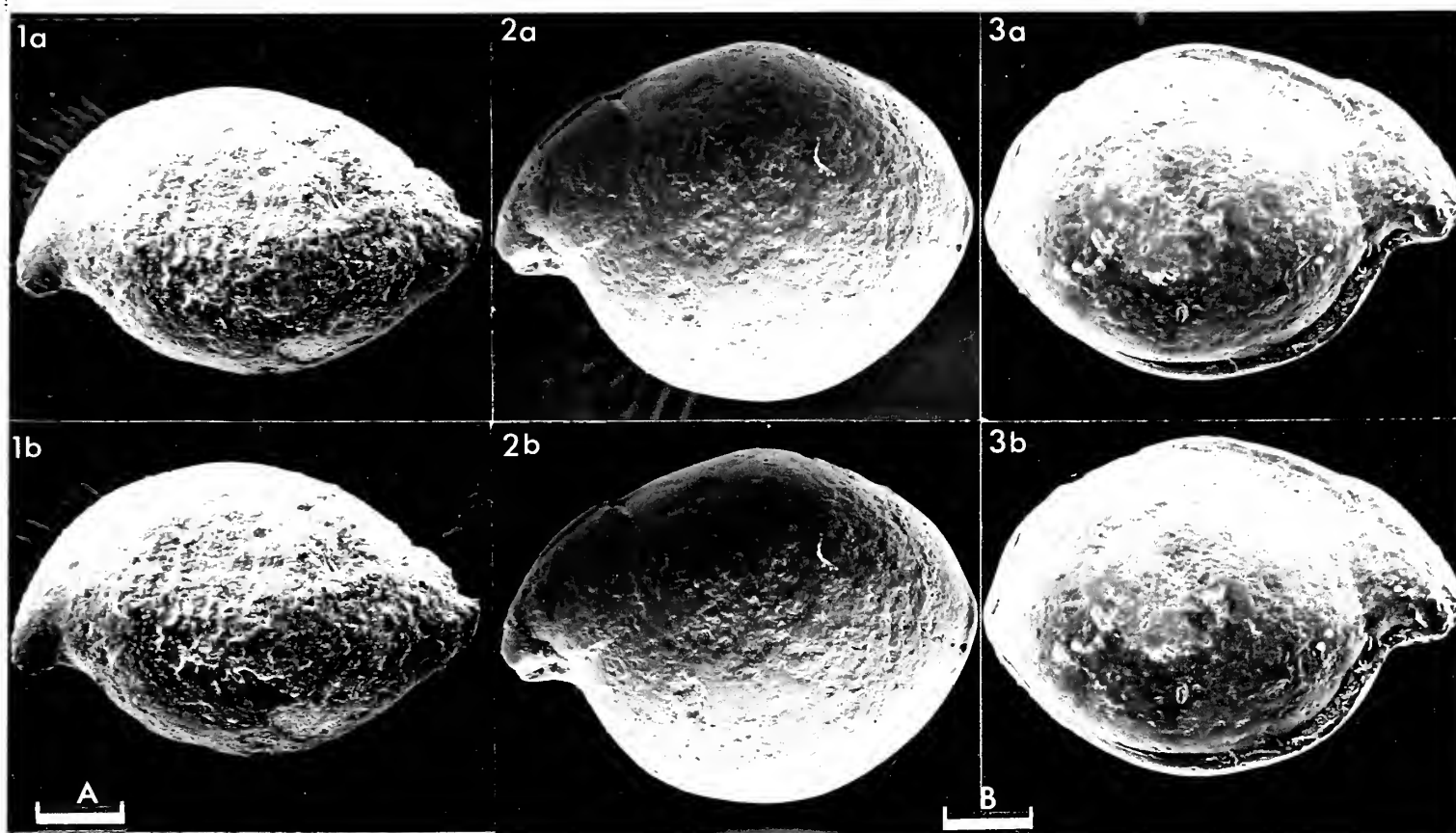
Distribution: Dr Donze informs me that this species occurs widely in the Vocontian Trough where it is an important marker, being confined to the basal Valanginian Beds and not so far found above the base of the *Kilianella roubaudi* Zone.



Text-fig. 1. ♀ LV, ext. musc. sc. (157132).

Explanation of Plate 3, 12

Fig. 1, ♀ car., ext. dors. (**157130**, 1039 µm long); fig. 2, ♀ car., ext. vent. (**157131**, 1156 µm long). Scale A (200 µm; × 81), figs. 1, 2.



ON *CENTROCYPRIS VIRIDIS* NEALE sp. nov.

by John W. Neale
(University of Hull, England)

Centrocypris viridis sp. nov.

Holotype: University of Hull coll. no. **HU.250.R.1**, ♀ RV, LV, limbs and soft parts.
[Paratypes: University of Hull coll. nos. **HU.250.R.2–9** (all ♀)].

Type locality: A tank at Ma-Eliya, near Battuluoya, Sri Lanka; approx. lat. 7°48'N, long. 79°55'E. Recent.

Derivation of name: From the Latin *viridis*, green; referring to the beautiful deep green colour observed in fresh material.

Figured specimens: University of Hull coll. nos. **HU.250.R.4a** (♀ LV, RV: Pl. 3, 14, figs. 1, 2; Pl. 3, 18, fig. 2), **HU.250.R.1a,b** (♀ LV, RV, limbs & soft parts: Pl. 3, 16, figs. 1, 2; Pl. 3, 18, figs. 1, 3; Text-figs. 1, 2), **HU.250.R.2a** (♀ LV, RV: Pl. 3, 20, figs. 1–3). All specimens are from the type locality.

Diagnosis: Shell covered with small spines, not strongly vaulted posterodorsally in lateral view, furcal rami slender.

Explanation of Plate 3, 14

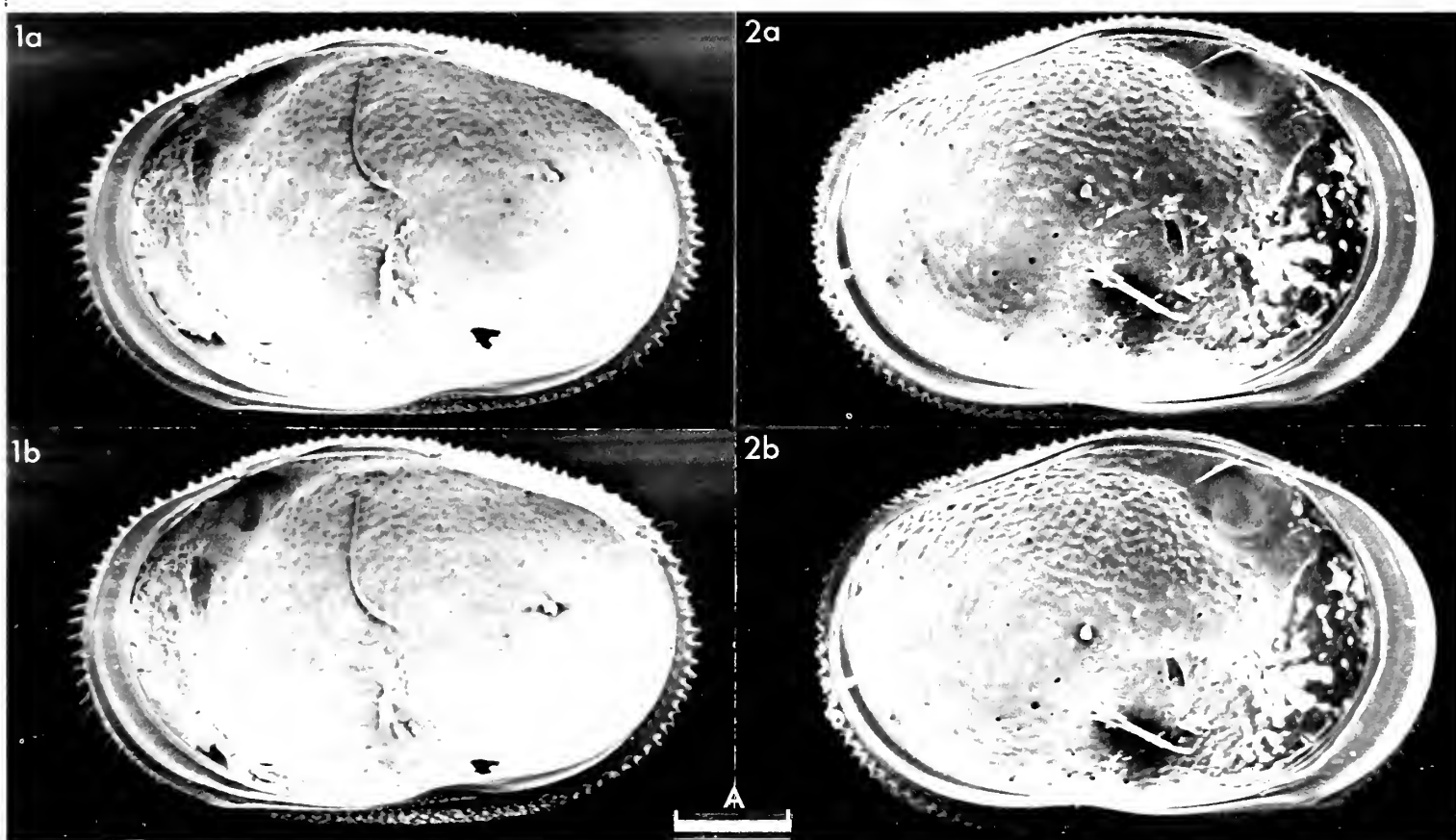
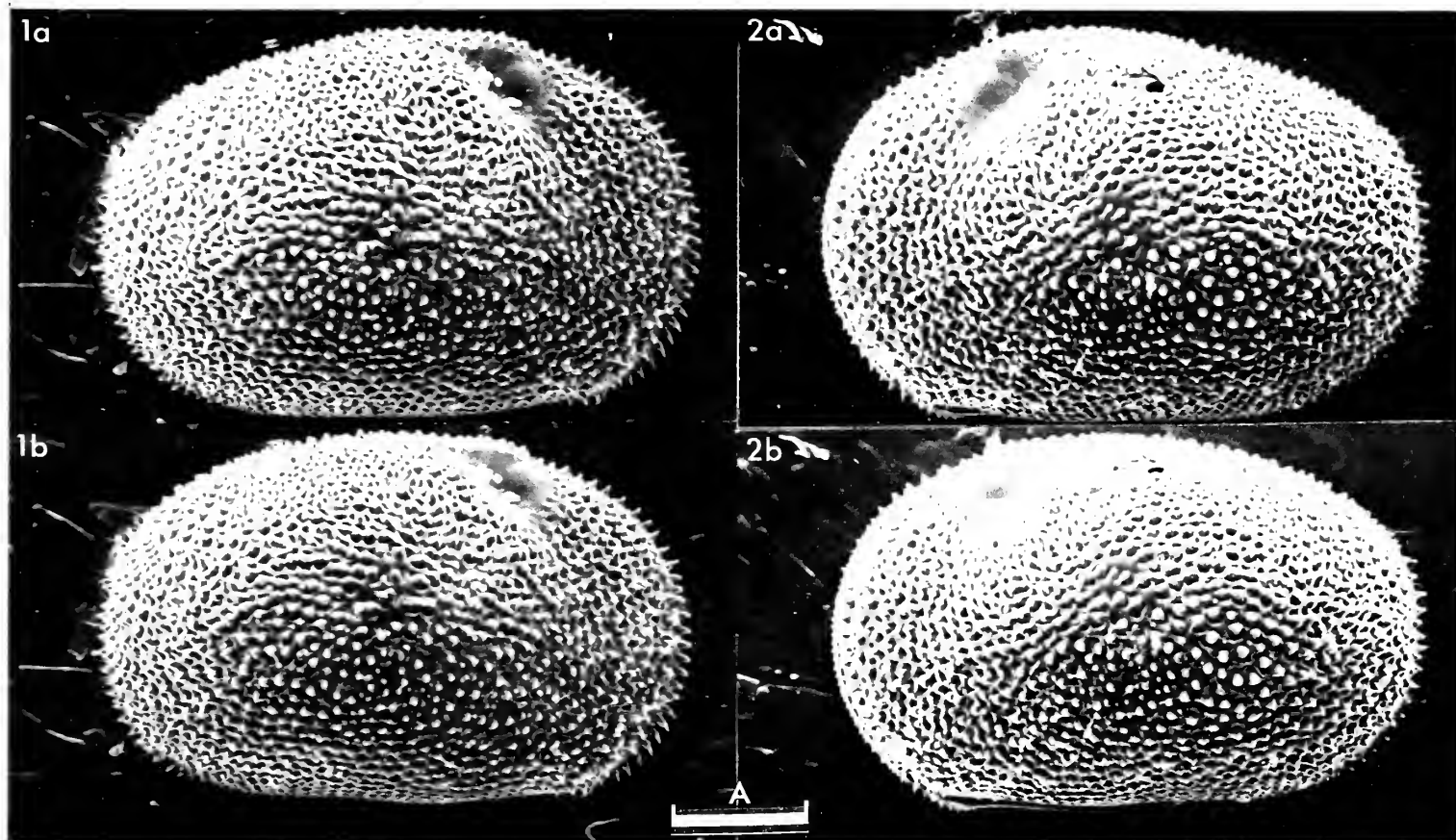
Figs. 1, 2, ♀ (**HU.250.R.4a**, 920 µm long): fig. 1, RV, ext. lat.; fig. 2, LV, ext. lat.
Scale A (200 µm; × 90), figs. 1, 2.

Remarks: The three species of *Centrocypris* so far described have all come from Africa or from islands associated with the African mainland, although Hartmann (1964, *Int. Revue ges. Hydrobiol.*) has recorded *Centrocypris horrida* Vavra, 1895 from a single locality in India. *Centrocypris viridis* differs from *Centrocypris jakulskii* Grochmalicki, 1914 (the closest of the three species of *Centrocypris*) in the lesser vaulting of the shell posterodorsally in lateral view and the somewhat more slender furcal rami. In the E African *C. jakulskii* the furcal claws are the same length but in *C. viridis* the sub-terminal claw is typically shorter than the terminal claw although there is some variation in this and about 20% of the specimens examined have the furcal claws of equal length. From *C. horrida* (Zanzibar, E Africa, Aldabra Island and India) the Sri Lanka species differs in lacking the strong marginal spination. From *Centrocypris margaritifera* Müller, 1898 (Madagascar), *C. viridis* differs in the absence of ribbing on the ventral surface, the absence of a posteroventral spine and in the very much shorter dorsal seta on the furca which in Müller's species appears to be equal in length to the sub-terminal claw.

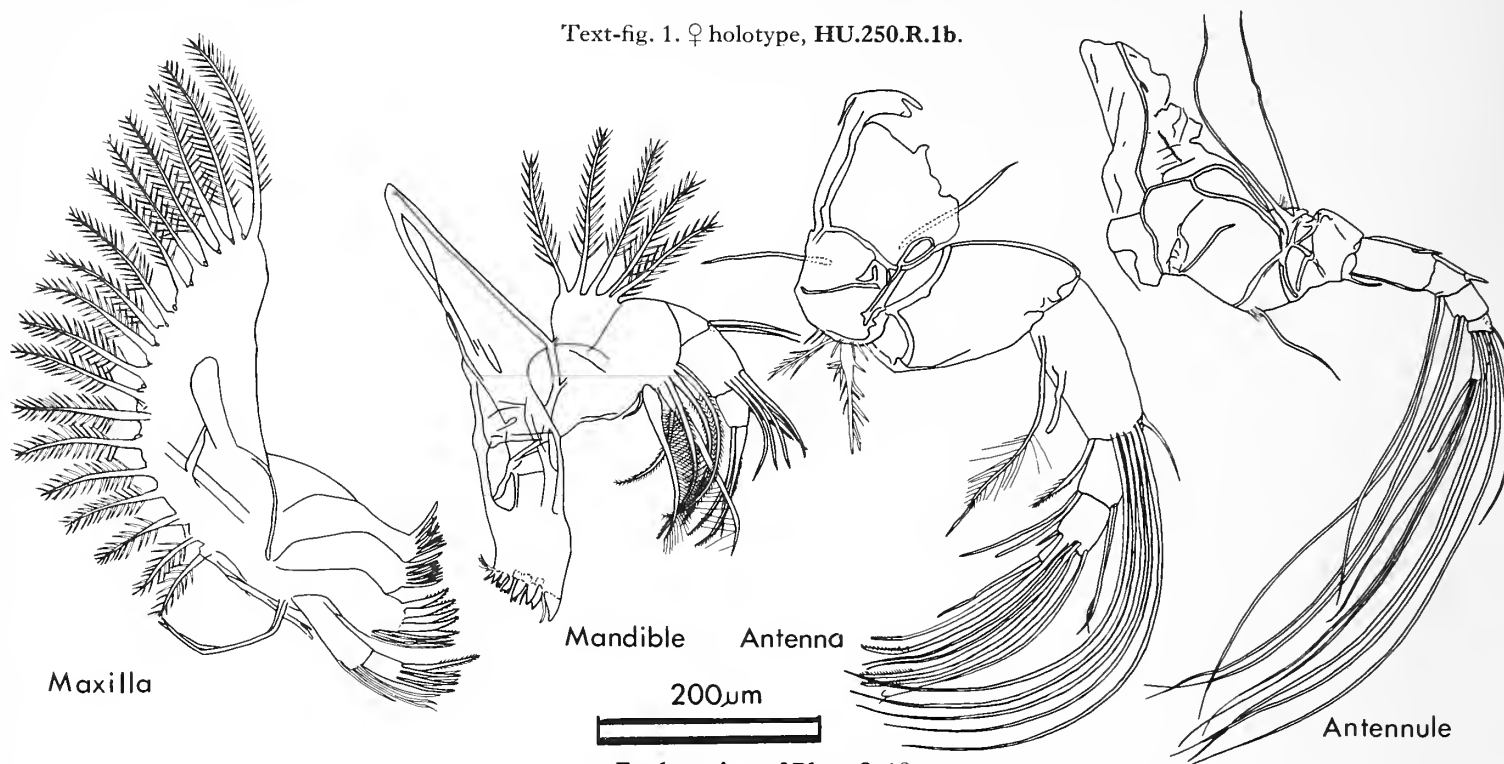
Distribution: *C. viridis* appears to be well established in Sri Lanka, the type locality yielding 146 specimens and paddy fields at Karainagar East, Jaffna (lat. 9°44'N, long. 79°53'E) providing another 38. In the Ma-Eliya sample the species was associated with *Cypris subglobosa* Sowerby, *Stenocypris major* (Baird), *Cypretta globosa* (Brady), *Hemicypris pyxidata* (Moniez) and a new species of *Strandesia*. At Karainagar East the sample contained only *C. viridis*, but another sample from the same locality contained *C. subglobosa* Sowerby and the same new species of *Strandesia*.

Explanation of Plate 3, 16

Figs. 1, 2, ♀ (holotype, **HU.250.R.1a**, 950 µm long): fig. 1, RV, int. lat.; fig. 2, LV, int. lat.
Scale A (200 µm; × 84), figs. 1, 2.



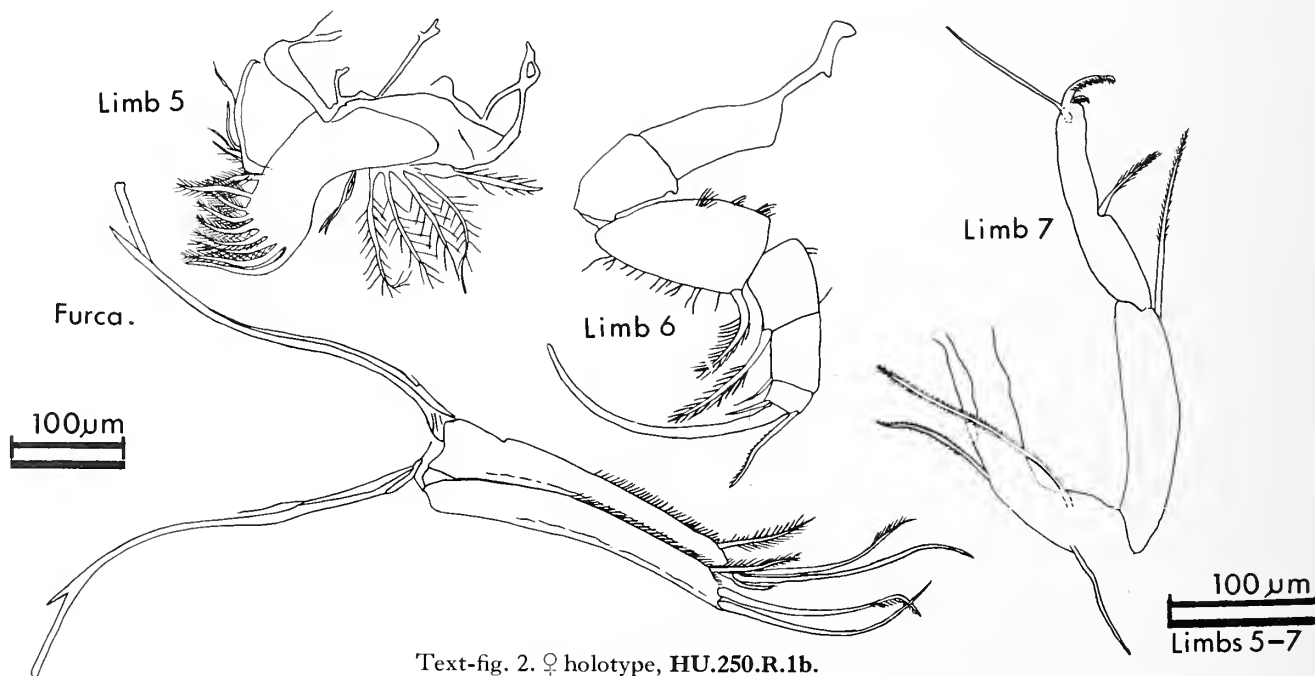
Text-fig. 1. ♀ holotype, HU.250.R.1b.



Explanation of Plate 3, 18

Fig. 1, ♀ RV, int. ant. obl. (holotype, HU.250.R.1a); fig. 2, ♀ car., ext. dors. (HU.250.R.4a); fig. 3, ♀ LV, int. ant. obl. (holotype, HU.250.R.1a).

Scale A (200 μm; × 63), figs. 1, 3; scale B (200 μm; × 72), fig. 2.

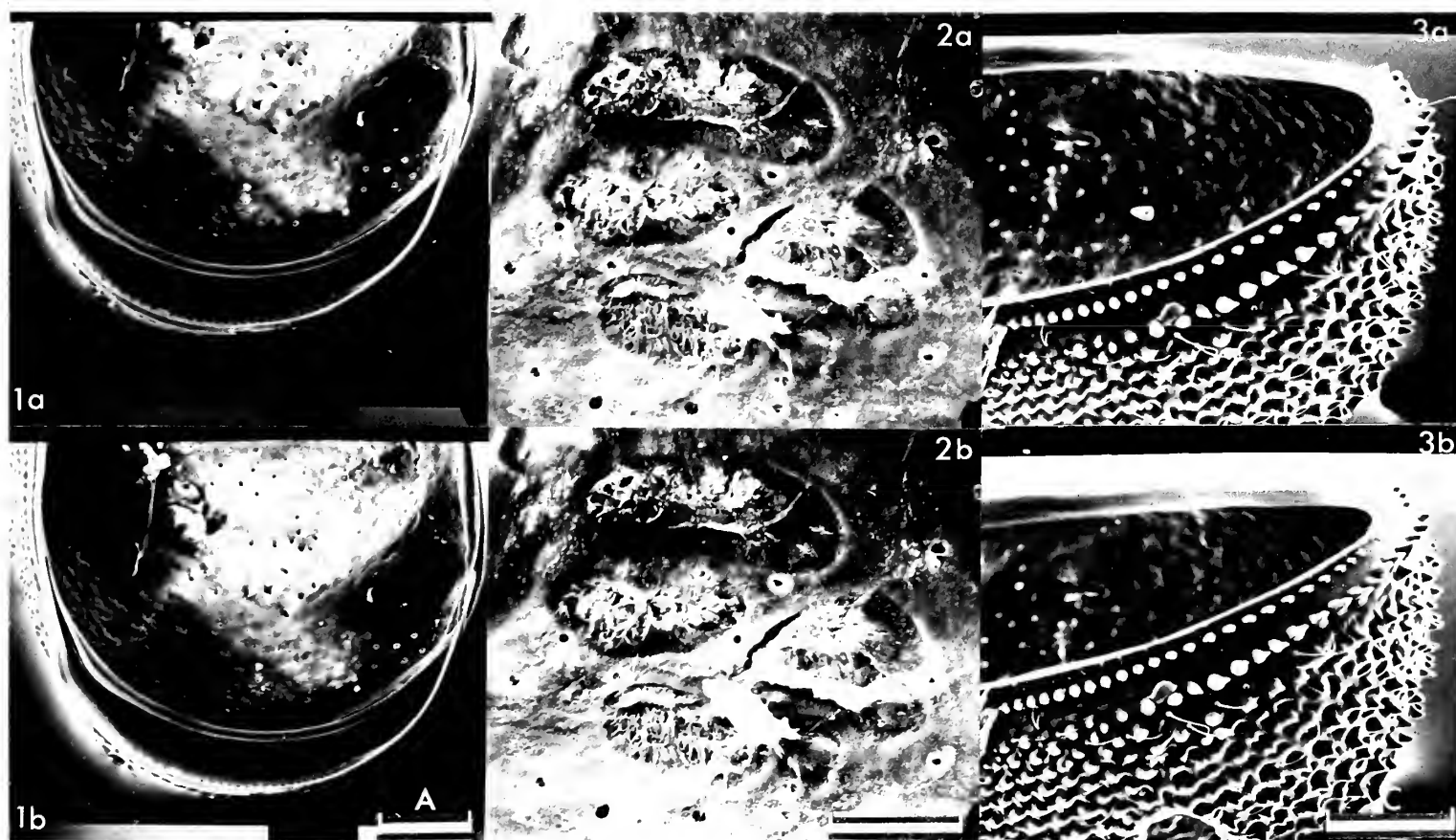
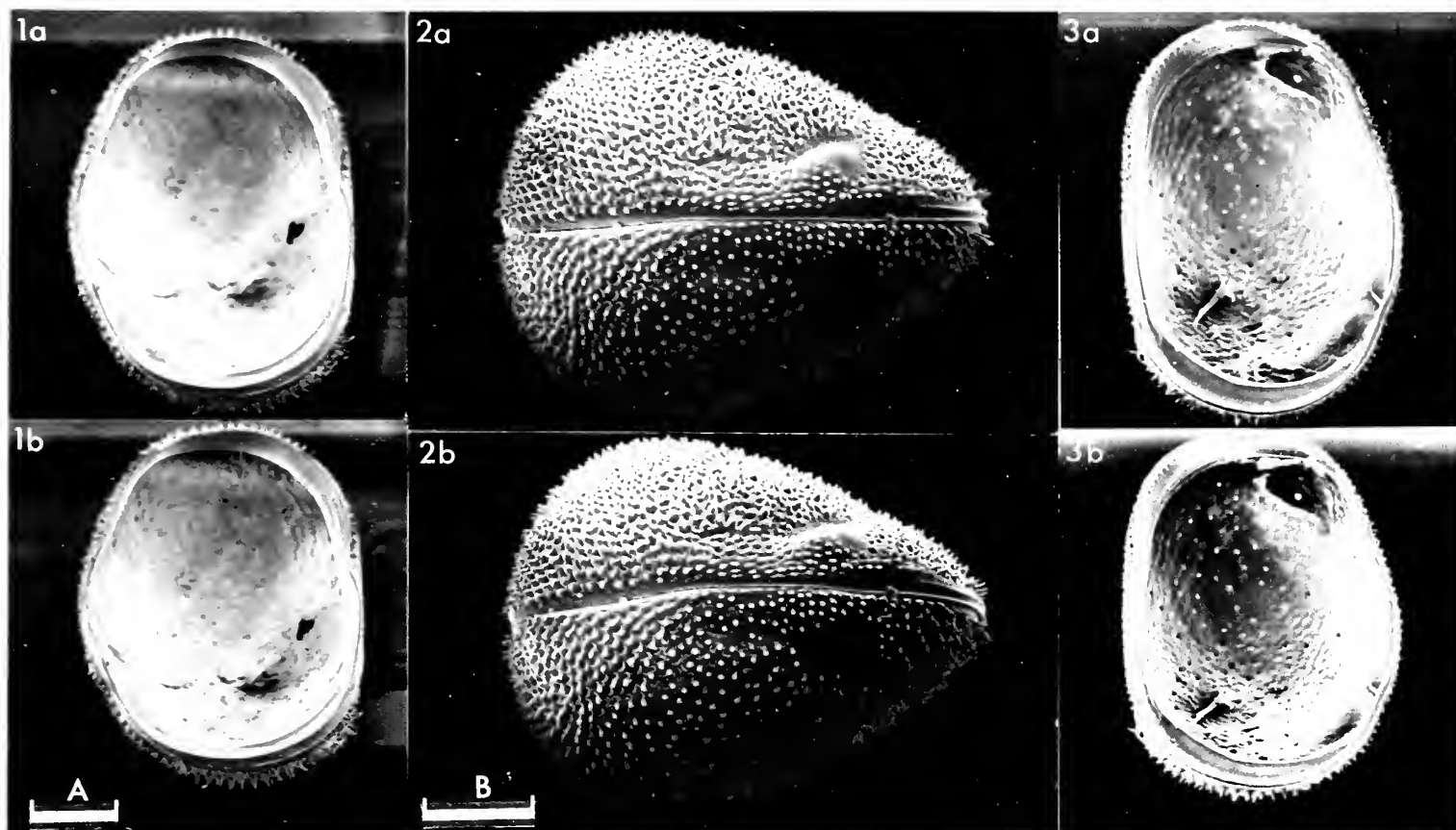


Text-fig. 2. ♀ holotype, HU.250.R.1b.

Explanation of Plate 3, 20

Figs. 1-3, ♀ (HU.250.R.2a, 1000 μm long): fig. 1, LV, ant. margin; fig. 2, RV, int. musc. sc.; fig. 3, RV, post. margin.

Scale A (100 μm; × 125), fig. 1; scale B (40 μm; × 450), fig. 2; scale C (100 μm; × 180), fig. 3.



ON *ONCOCYPRIS PUSTULOSA* GURNEY

by John W. Neale
(University of Hull, England)

Oncocypris pustulosa Gurney, 1916

- 1916 *Oncocypris pustulosa* sp. nov. R. Gurney, *Proc. zool. Soc. Lond.* 1916, 340, pl. 3, figs. 17–21.
1963 *Oncocypris pustulosa* Gurney, 1916; E. Triebel, *Senckenberg biol.* **44**, 35.
1975 *Oncocypris pustulosa* Gurney, 1916; R. G. Michael & R. Victor, *J. nat. Hist.* **9**, 509, text-figs. 1A–F.

Type specimens: The repository is unknown.

Type locality: A tank by Lady Horton's Drive at Kandy, Sri Lanka (Ceylon); approx. lat. 7°17'N, long. 80°40'E. Recent.

Figured specimens: University of Hull coll. nos. **HU.244.R.2a** (♀ LV, RV: Pl. 3, 22, fig. 1; Pl. 3, 26, fig. 3), **HU.244.R.1a** (♂ LV, RV: Pl. 3, 22, figs. 2, 3; Pl. 3, 24, figs. 1, 2; Pl. 3, 26, figs. 1, 2; Pl. 3, 28, figs. 2, 3), **HU.244.R.1b** (♂ limbs & soft parts: Pl. 3, 28, fig. 1; Text-figs. 1, 2).

Explanation of Plate 3, 22

Fig. 1, ♀ RV, ext. lat. (**HU.244.R.2a**, 545 µm long); fig. 2, ♂ RV, ext. ant. obl. (**HU.244.R.1a**, 493 µm long); fig. 3, ♂ RV, ext. lat. (**HU.244.R.1a**).
Scale A (100 µm; × 132), fig. 1; scale B (100 µm; × 144), figs. 2, 3.

Figured specimens: All specimens are from Rambewewa near Nochchiyagama, Sri Lanka; approx. lat. 8°17'N, long. (contd.) 80°12'E.

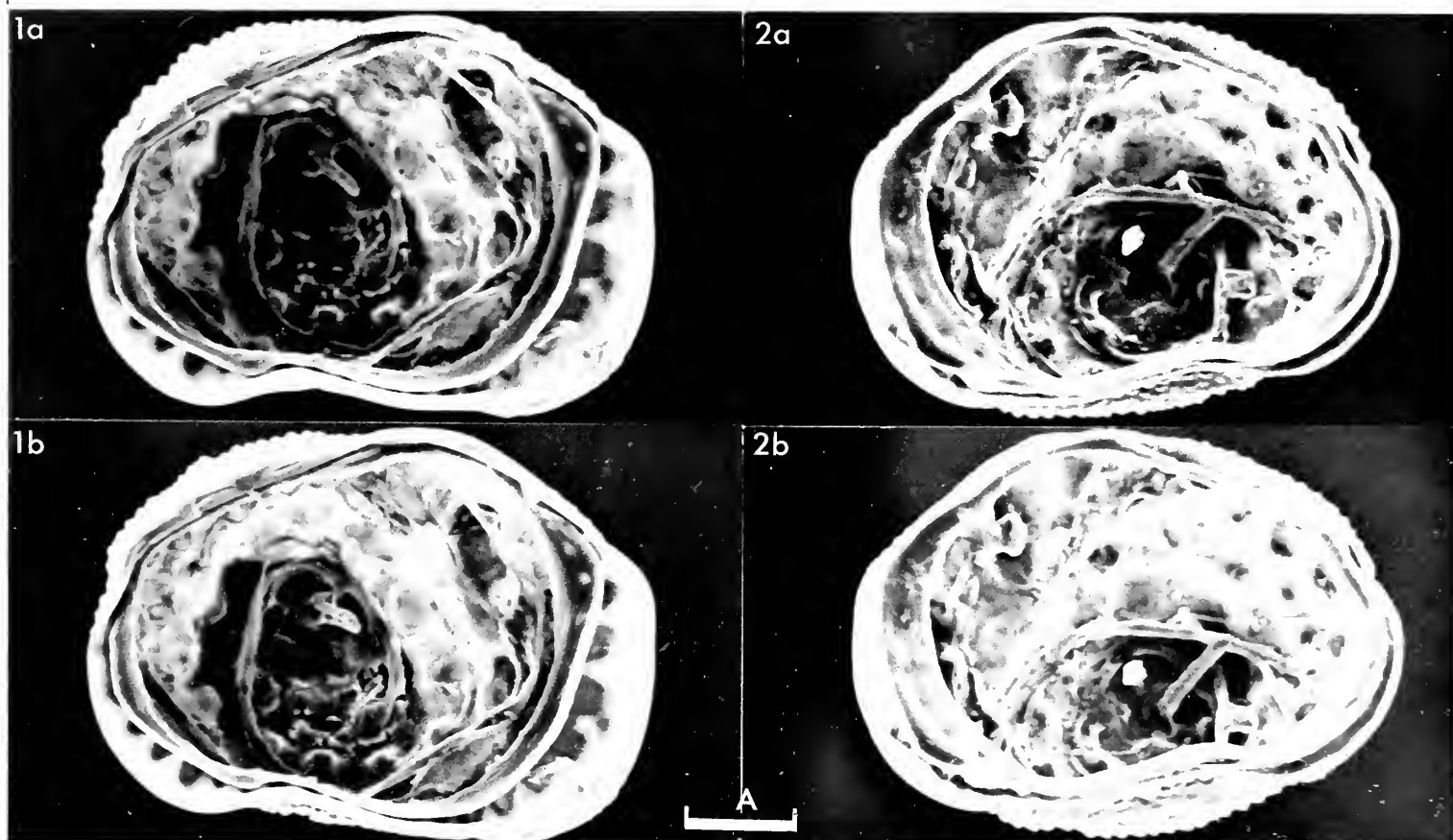
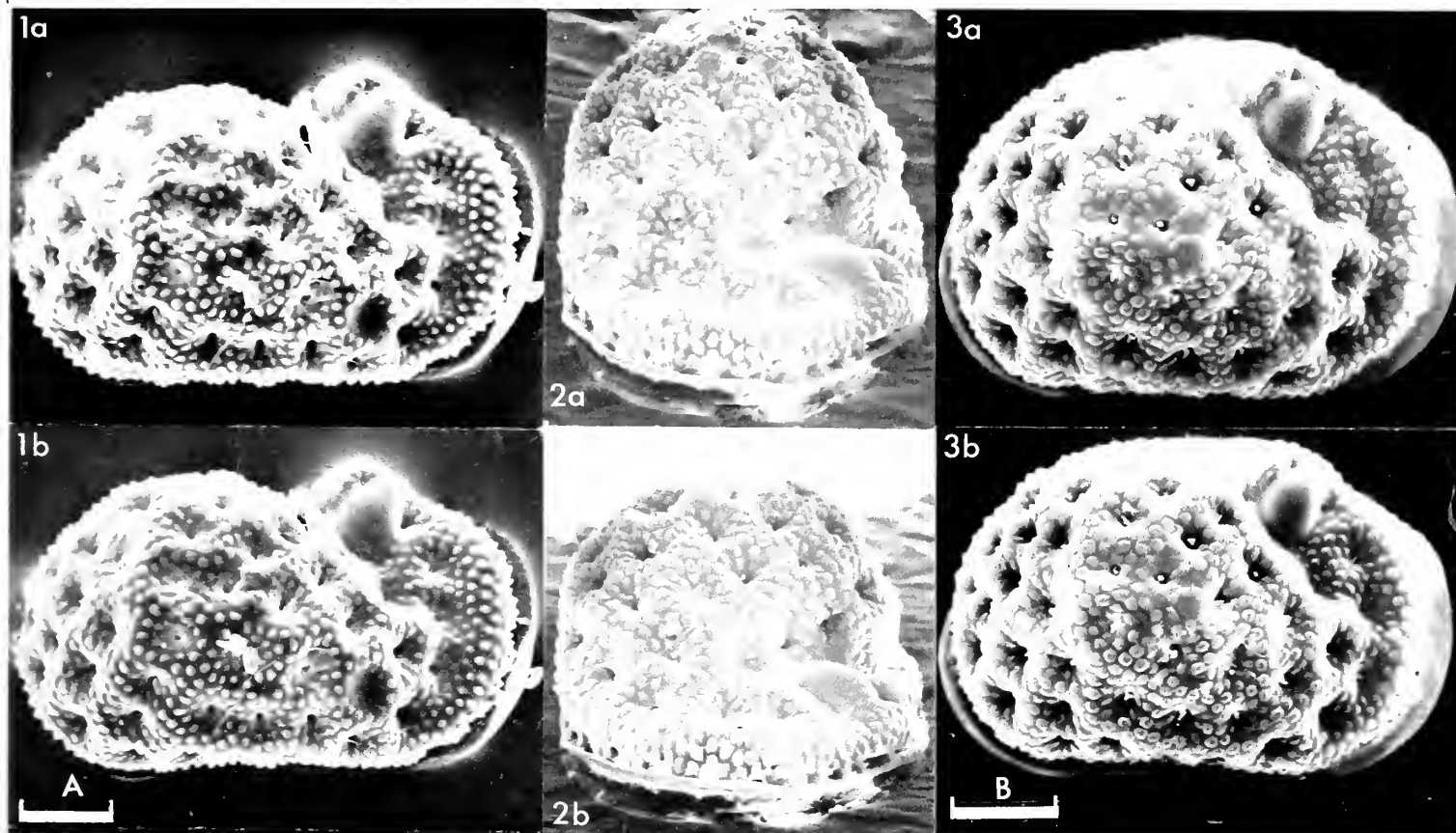
Diagnosis: Strongly vaulted carapace, egg-shaped in dorsal view, covered with pustules and with well developed eye tubercles and post-ocular sulcus. Left and right clasping limbs (limb 5) of male dissimilar. The flagelliform furca is characteristic of the genus.

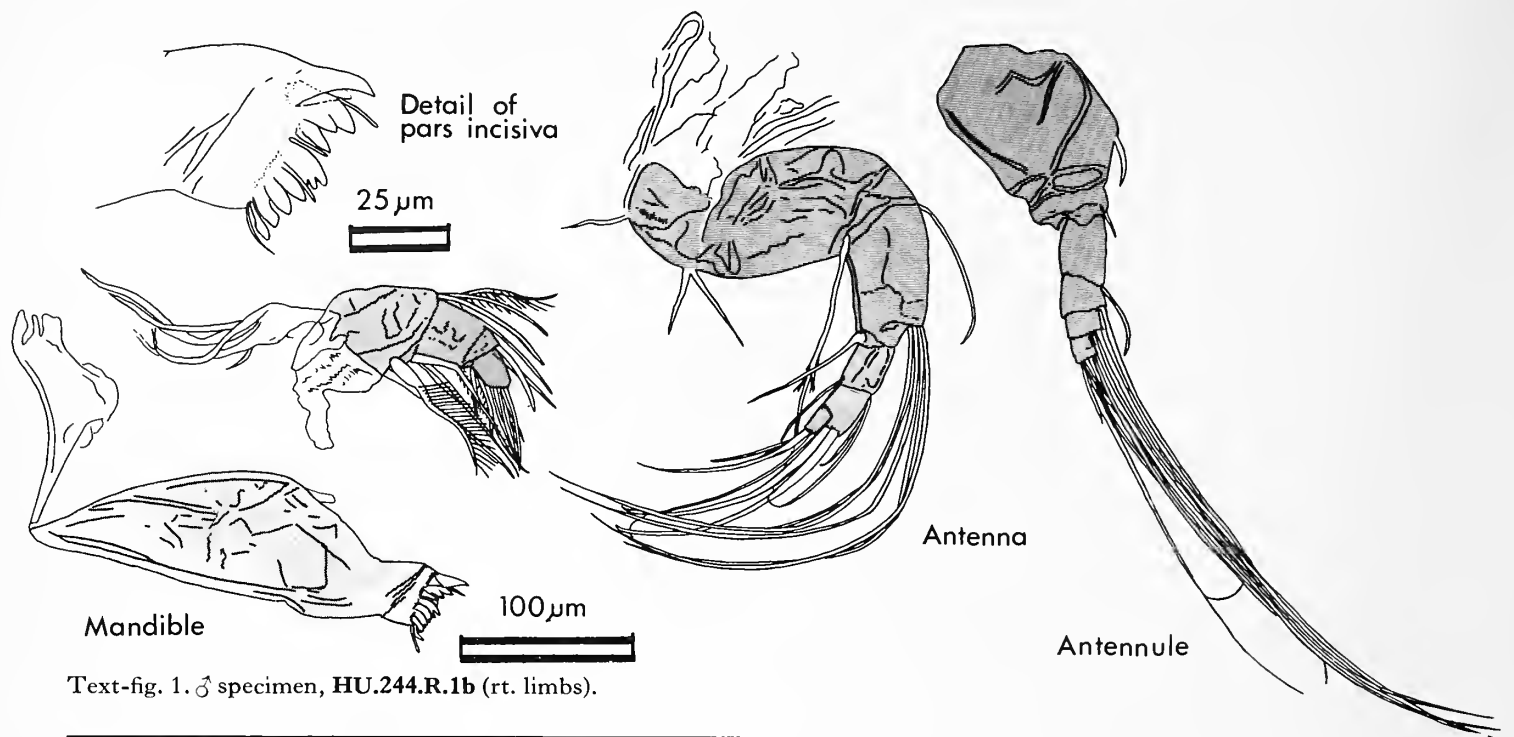
Remarks: Gurney (1916) noted that there was a single small seta on the maxilla (*recte* second maxilla on his terminology) and that G. W. Müller (1898, *Abh. senckenb. naturforsch. Ges.* **21**, 286) gives the absence of a respiratory plate on this limb as a feature of the genus. Michael & Victor (1975) note that in their material from a coastal freshwater pond in Kerala State, S India, there is an unmistakable respiratory plate on the second maxilla although they do not figure it. The Sri Lanka material confirms this and is figured here, the left and right parts of this limb in the male being dissimilar. Michael & Victor (1975) note 17 rosettes in the Zenker's organ. Present material shows that the number varies between 16 and 18. Carapace shows sexual dimorphism, in the present material the male being shorter and higher than the female.

Distribution: This species has only been found in Sri Lanka and S India (Kerala).

Explanation of Plate 3, 24

Fig. 1, ♂ LV, int. lat. (**HU.244.R.1a**); fig. 2, ♂ RV, int. lat. (**HU.244.R.1a**).
Scale A (100 µm; × 156), figs. 1, 2.

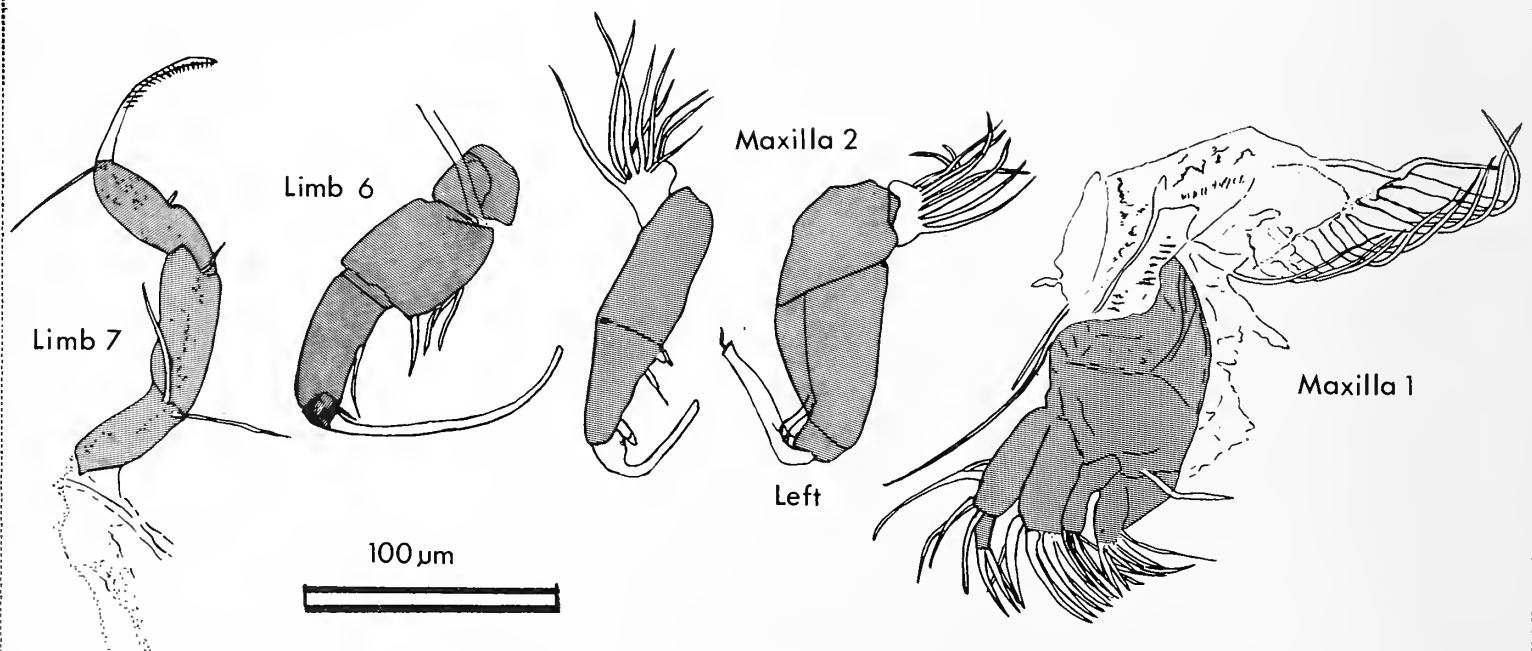




Text-fig. 1. ♂ specimen, HU.244.R.1b (rt. limbs).

Explanation of Plate 3, 26

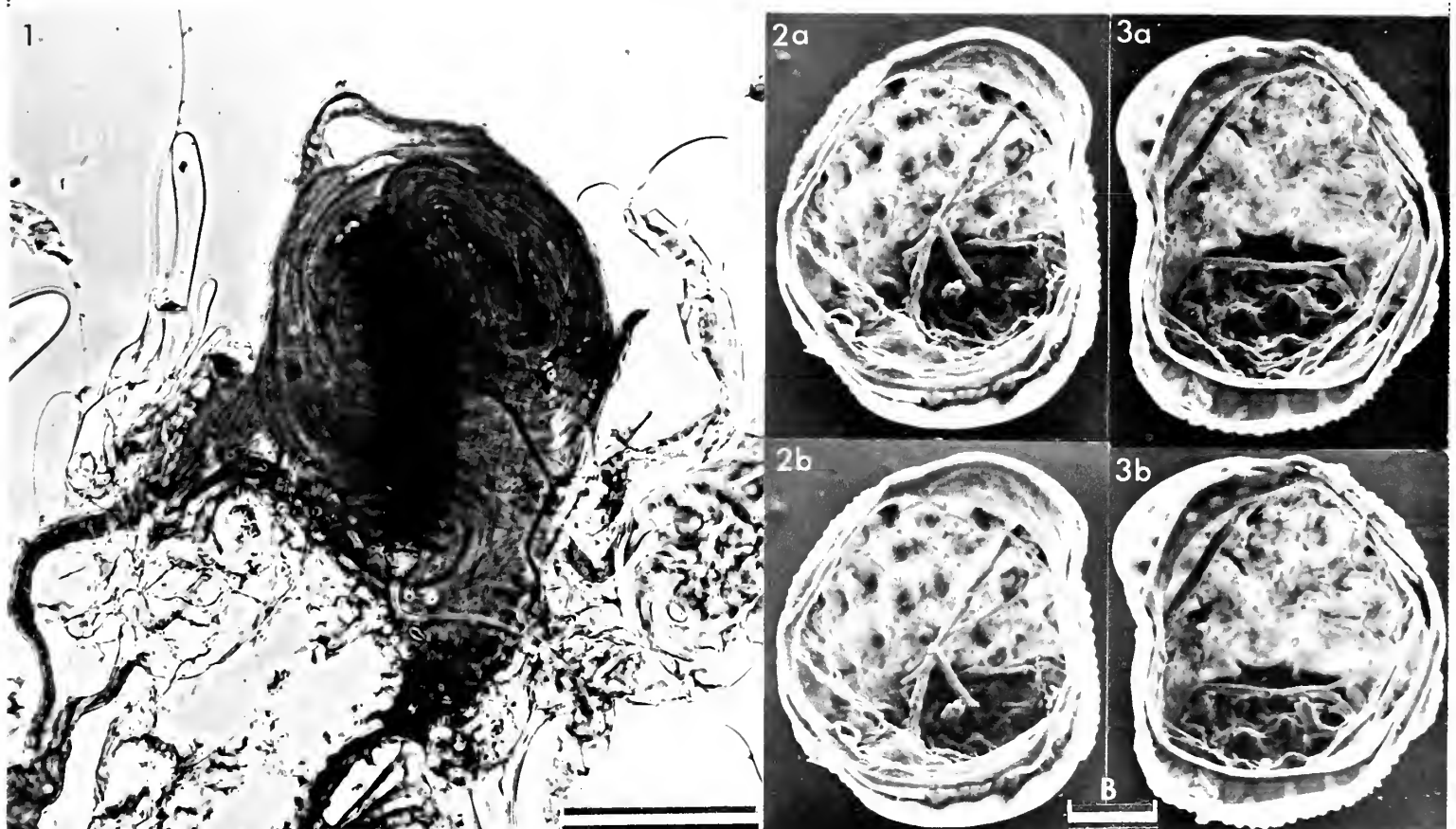
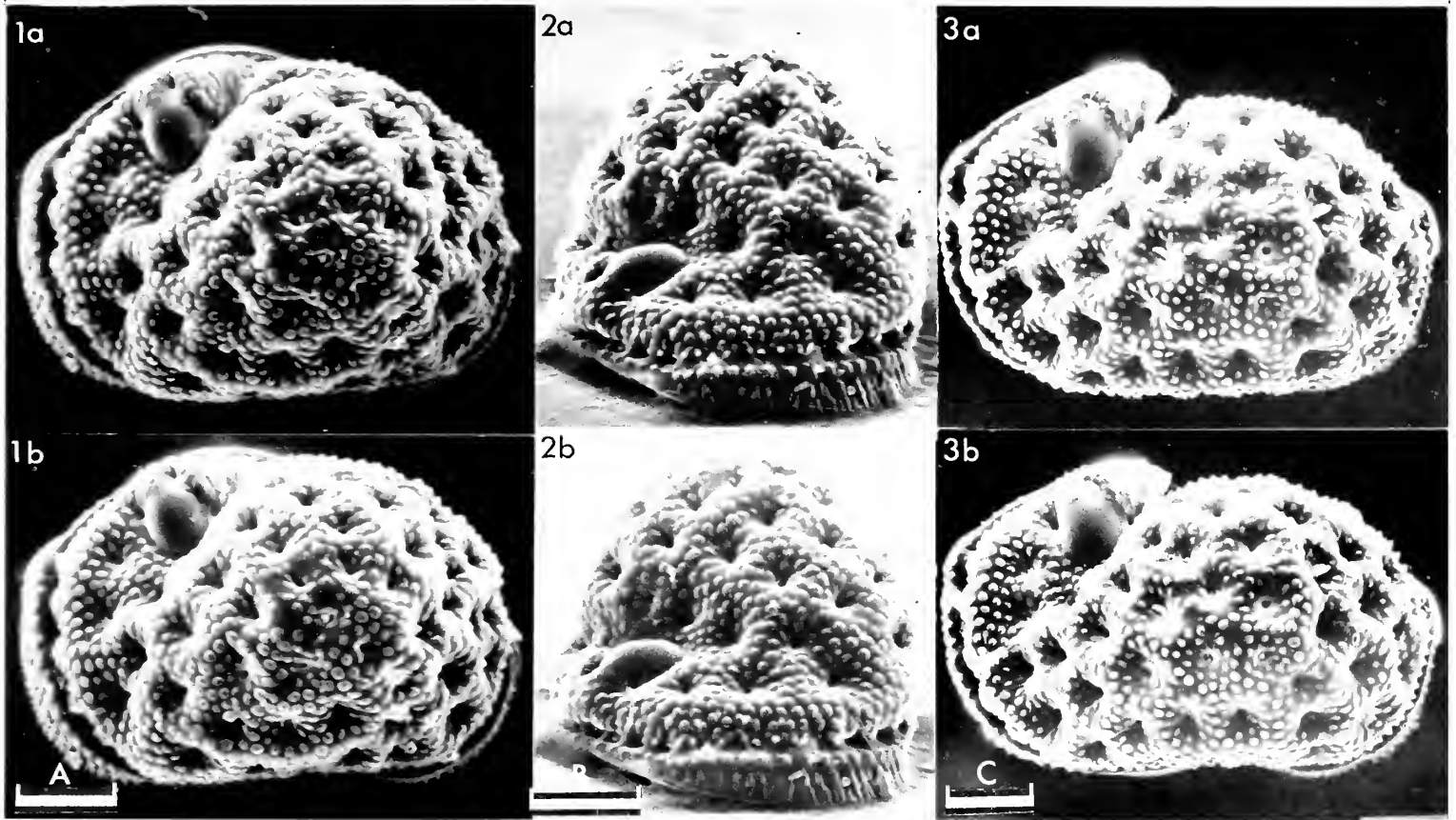
Fig. 1, ♂ LV, ext. lat. (HU.244.R.1a); fig. 2, ♂ LV, ext. ant. obl. (HU.244.R.1a); fig. 3, ♀ LV, ext. lat. (HU.244.R.2a).
Scale A (100 µm; × 142), fig. 1; scale B (100 µm; × 151), fig. 2; scale C (100 µm; × 128), fig. 3.



Text-fig. 2. ♂ specimen, HU.244.R.1b (all rt. limbs except where stated).

Explanation of Plate 3, 28

Fig. 1, ♂, Zenker's organ (HU.244.R.1b); fig. 2, ♂ RV, int. ant. obl. (HU.244.R.1a); fig. 3, ♂ LV, int. ant. obl. (HU.244.R.1a).
Scale A (100 µm; × 278), fig. 1; scale B (100 µm; × 128), figs. 2, 3.



ON *STENOCYPRIS FERNANDOI* NEALE sp. nov.

by John W. Neale
(University of Hull, England)

Stenocypris fernandoi sp. nov.

Holotype: University of Hull coll. no. **HU.239.R.5**, ♀ RV, LV, limbs and soft parts.
[Paratypes: University of Hull coll. nos. **HU.239.R.1–4, 6–8** (five ♂♂, two ♀♀)].

Type locality: Pond, Yala-Palatupana, Sri Lanka; approx. lat. 6°19'N, long. 81°27'E. Recent.

Derivation of name: In honour of Professor C. H. Fernando of the University of Waterloo, Ontario, Canada.

Figured specimens: University of Hull coll. nos. **HU.239.R.7a** (♀: Pl. 3, 30, figs. 1, 2), **HU.239.R.5a** (♀: Pl. 3, 32, figs. 1, 2; Pl. 3, 34, figs. 1, 2; Pl. 3, 36, figs. 3, 4), **HU.239.R.1b** (♂: Pl. 3, 36, fig. 1), **HU.239.R.8b** (♂: Pl. 3, 36, fig. 2). All specimens are from the type locality.

Explanation of Plate 3, 30

Figs. 1, 2, ♀ RV (**HU.239.R.7a**, 4620 µm long): fig. 1, ext. lat.; fig. 2, ext. lat. post. termination.
Scale A (1 mm; × 22), fig. 1; scale B (40 µm; × 250), fig. 2.

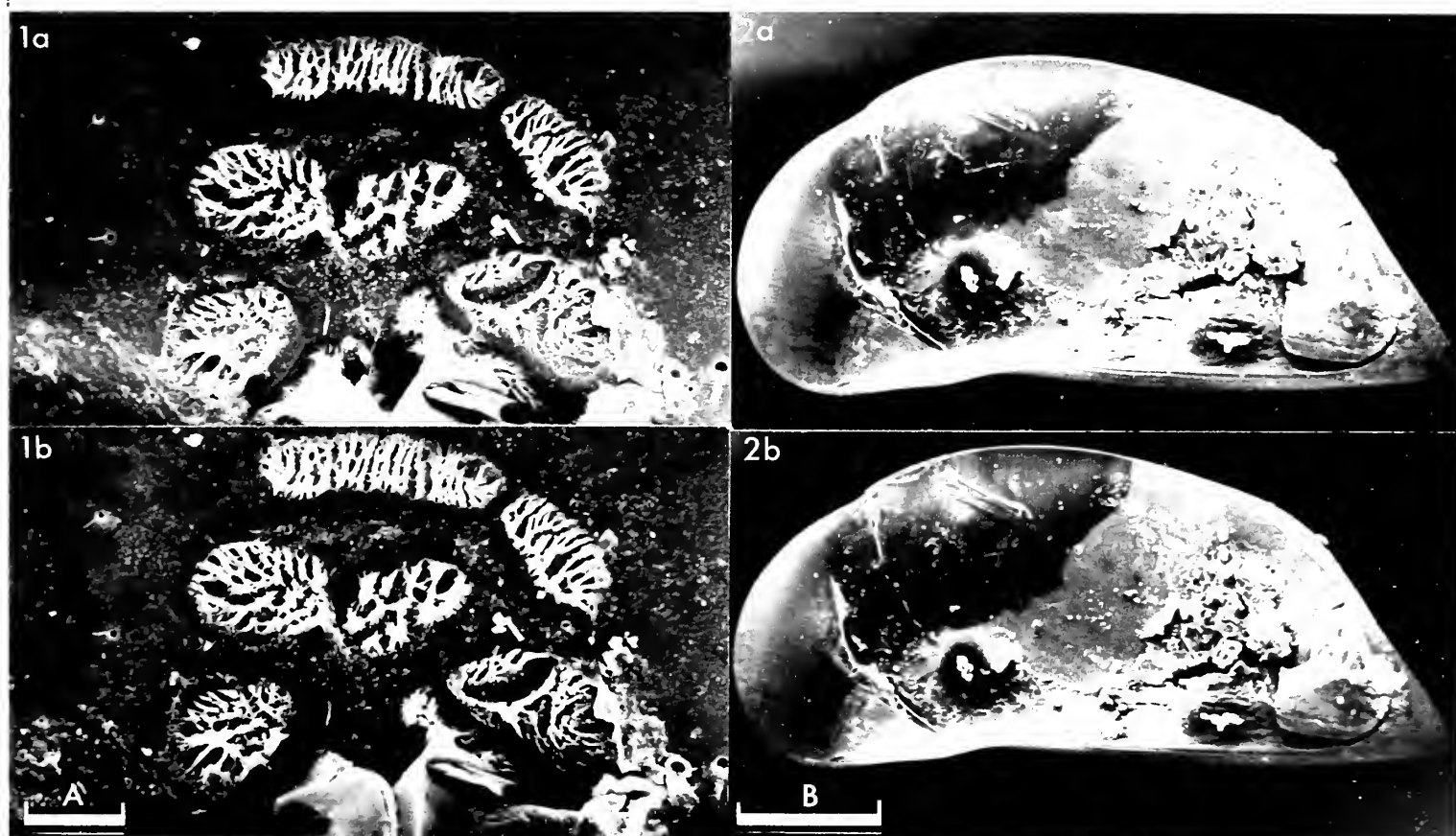
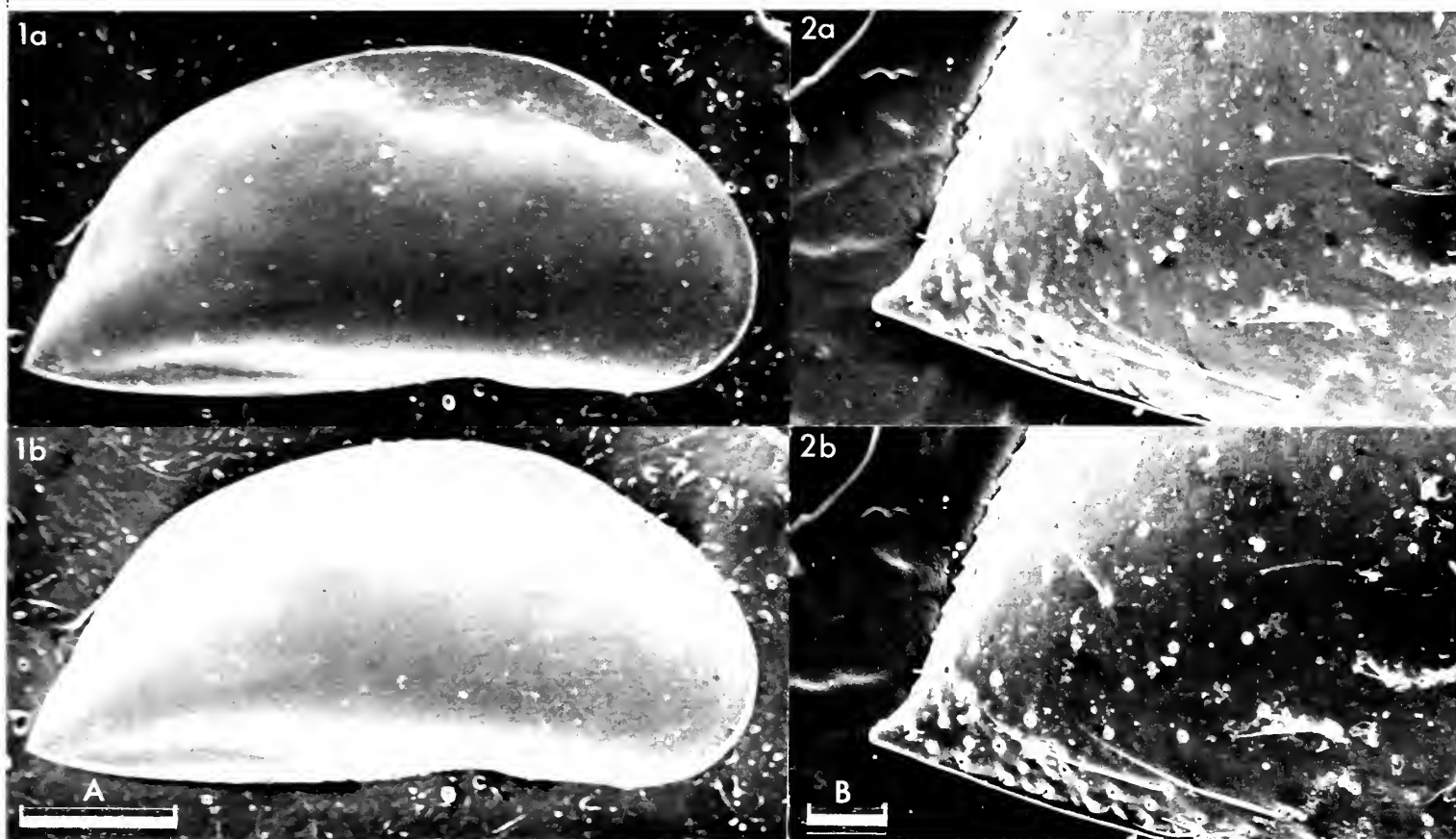
Diagnosis: A large stenocyprid (length: ♂♂ 3.98–4.54 mm, ♀♀ 4.62–5.05 mm) with sharply pointed posterior termination. Marked sexual dimorphism in second and fifth limbs. Furcal rami assymetric, the right ramus strongly spinose, the spines not grouped or bunched. Zenker's organ with 40–45 rosettes.

Remarks: Very few species approach *S. fernandoi* in size. *Stenocypris elongata* Daday, 1910 (5 mm, E Africa) differs in being lower in proportion to the length, in shape and in the four groups of hairs on the right furca. *Stenocypris cultrata* Müller, 1900 (3.9–4.7 mm, Africa) differs in shape, the anterior end being lower in lateral view, the posterodorsal margin steeper and with strong marginal hairs on each side of the posterior termination; the hairs on the right furcal ramus are markedly grouped. *Stenocypris biwasi* Deb, 1972 (4.3 mm, India) is much more elongate and has much better developed marginal hairs. *Stenocypris krishnakantai* Deb, 1972 (5.37 mm, India) lacks the marginal band of pore canals and is not a *Stenocypris* but probably a *Chrissia* Hartmann, 1957. *Stenocypris aldabrae* Müller, 1898 (2.9–3.5 mm, Aldabra, Indian Ocean) is generally closest but differs in the less acute posterior termination in lateral view and the much wider right furcal ramus, as well as in overall size.

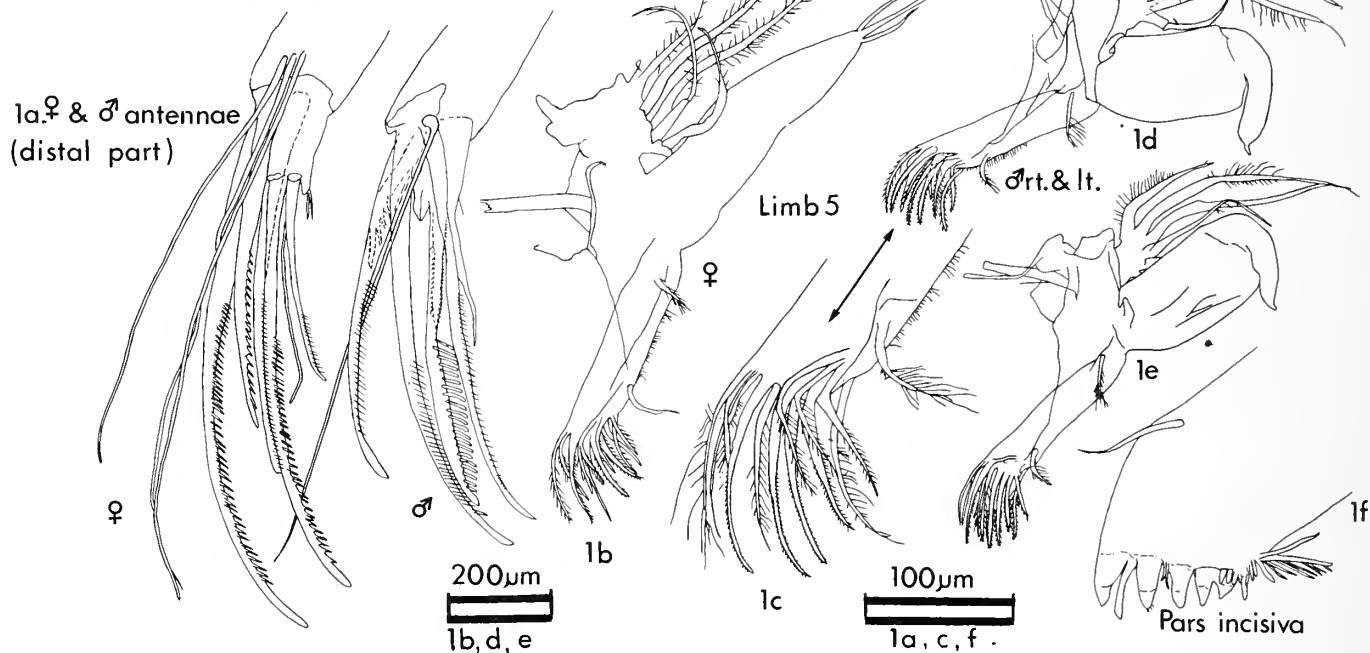
Distribution: So far this species has only been found at the one locality where over 100 specimens were available for study.

Explanation of Plate 3, 32

Figs. 1, 2, ♀ RV (holotype, **HU.239.R.5a**, 4920 µm long): fig. 1, int. musc. sc.; fig. 2, int. lat.
Scale A (40 µm; × 330), fig. 1; scale B (1 mm; × 20), fig. 2.



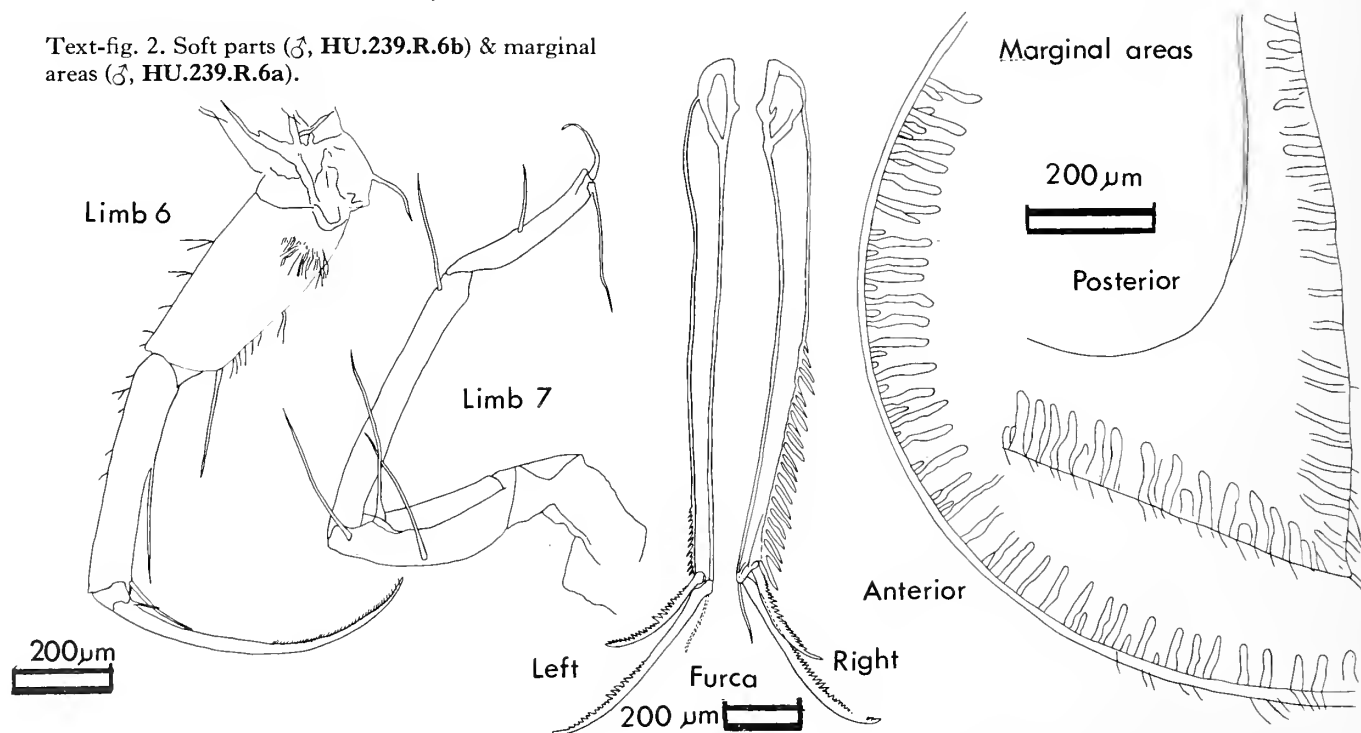
Text fig. 1. Soft parts of holotype
HU.239.R.5b & paratype HU.239.R.6b.



Explanation of Plate 3, 34

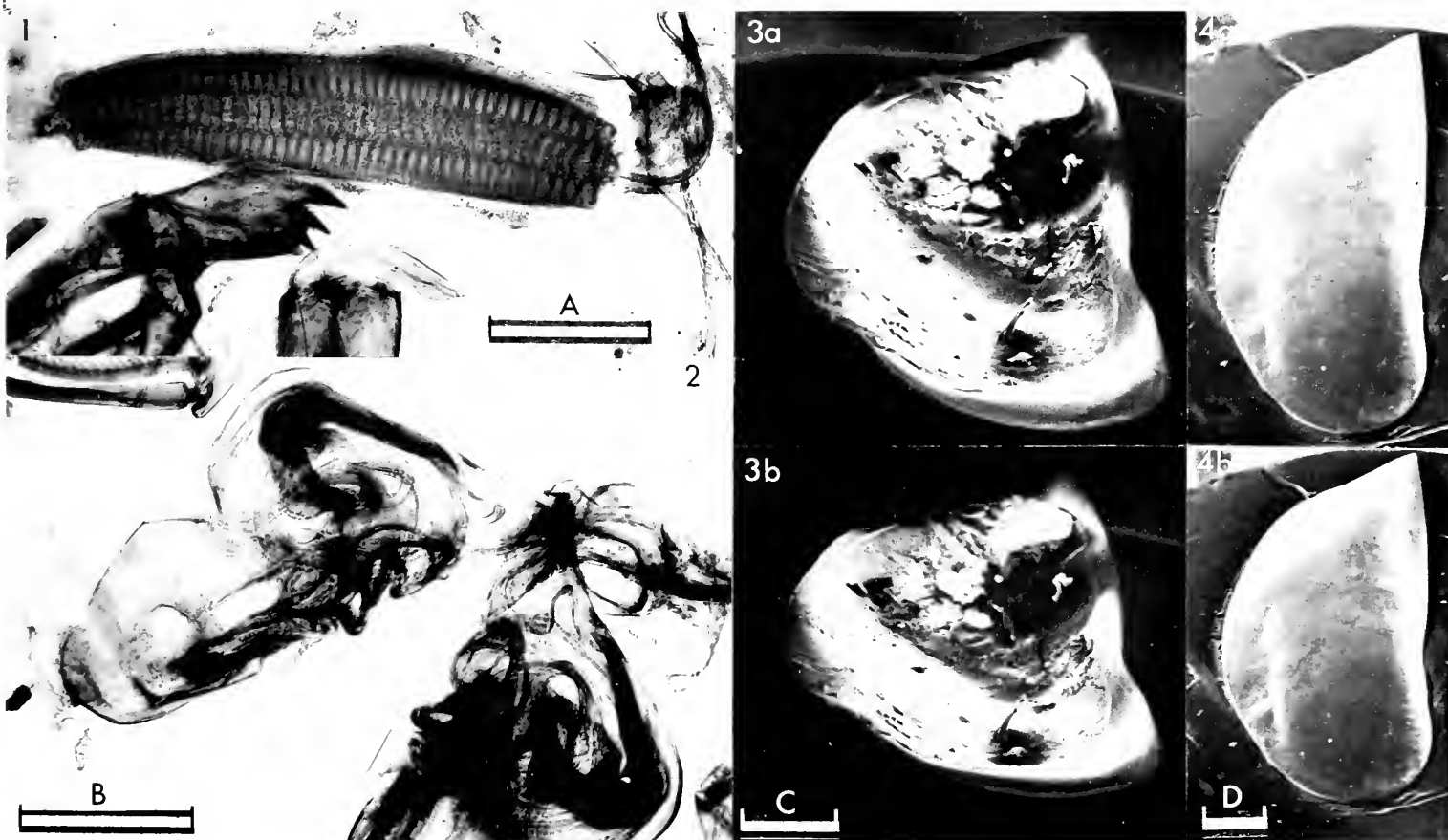
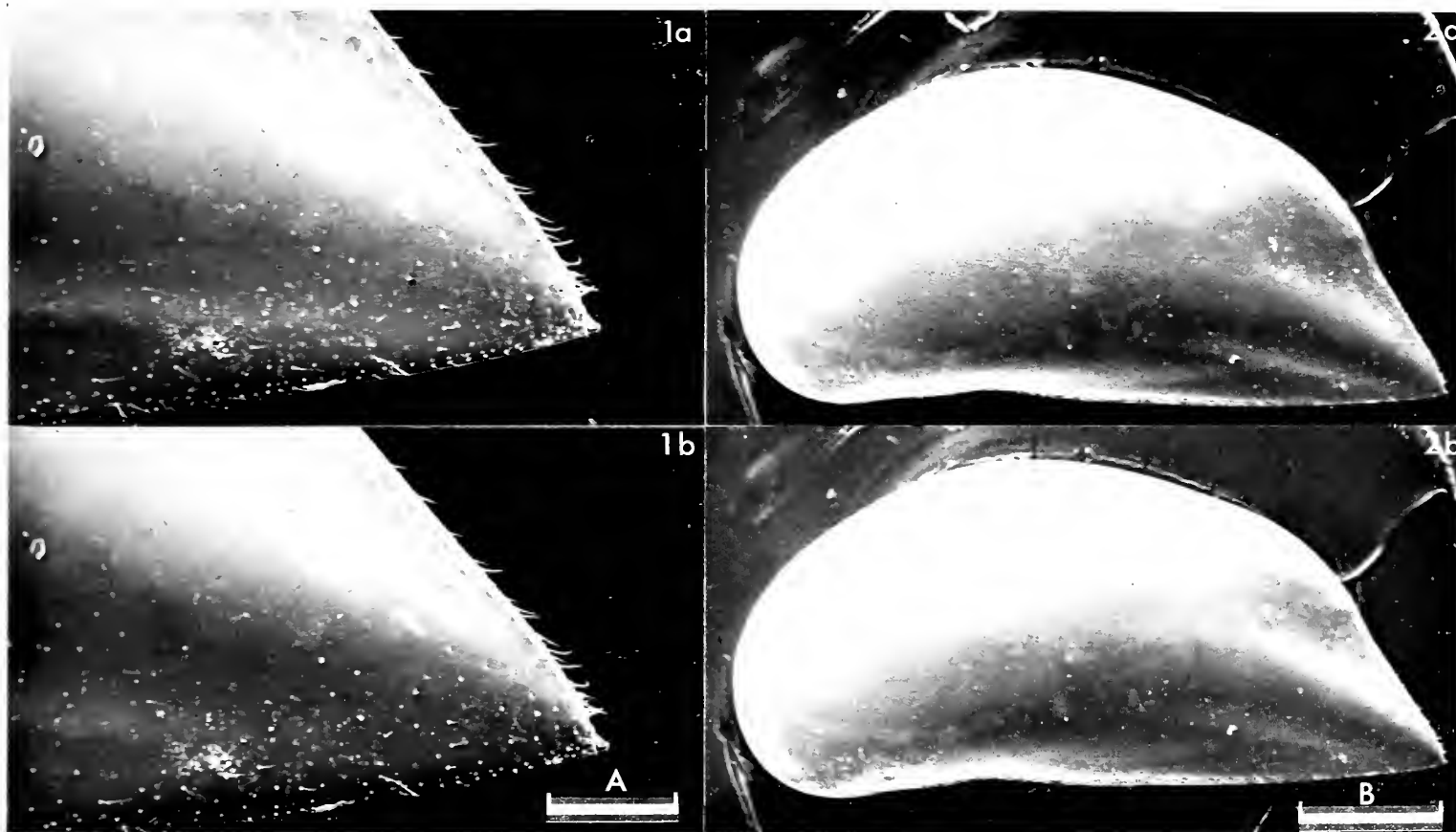
Figs. 1, 2, ♀ LV (holotype, HU.239.R.5a): fig. 1, ext. lat. post. termination; fig. 2, ext. lat. Scale A (200 μm; × 90), fig. 1; scale B (1 mm; × 20), fig. 2.

Text-fig. 2. Soft parts (♂, HU.239.R.6b) & marginal areas (♂, HU.239.R.6a).



Explanation of Plate 3, 36

Fig. 1, ♂, Zenker's organ (HU.239.R.1b); fig. 2, ♂, hemipene (HU.239.R.8b); fig. 3, ♀ RV, int. ant. obl. (holotype, HU.239.R.5a); fig. 4, ♀ LV, ext. ant. obl. (holotype, HU.239.R.5a). Scale A (200 μm; × 113), fig. 1; scale B (200 μm; × 120), fig. 2; scale C (400 μm; × 33), fig. 3; Scale D (500 μm; × 18), fig. 4.



ON *ILYOCYPRIS TAPROBANENSIS* NEALE sp. nov.

by John W. Neale
(University of Hull, England)

Ilyocypris taprobanensis sp. nov.

Holotype: University of Hull coll. no. **HU.242.R.1**, ♀ LV, RV, limbs and soft parts.

Type locality: Estate pond in coconut plantation, Battuluoya, Sri Lanka; approx. lat. 7°42'N, long. 79°48'E.

Derivation of name: From the Latin *taprobane*, Ceylon.

Figured specimens: University of Hull coll. nos. **HU.242.R.1** (♀ LV, RV: Pl 3, 38, figs. 1, 2; Pl. 3, 38, figs. 1–3), **HU.242.R.2** (♂ LV, RV, limbs & soft parts: Text-fig. 1). All material from the type locality.

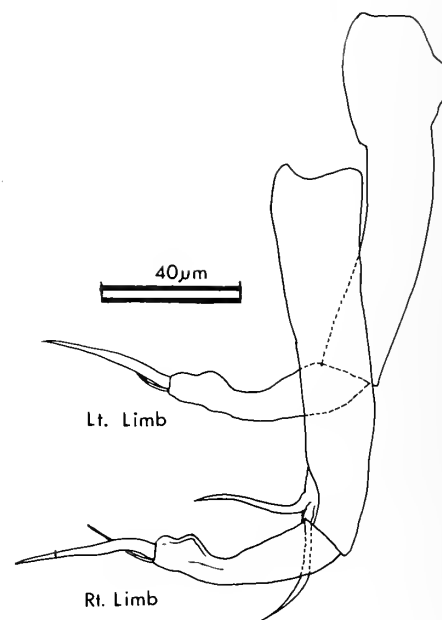
Diagnosis: Valves with variable spination, even between left and right valves of same individual. Small peripheral spines, about 12 anteriorly, ten posteriorly, with larger tubercles or blunt spines inside them anteriorly and posteriorly. Of the latter the posteroventral, anteroventral and anteromedian are the most consistent. Furca with very slender claws.

Explanation of Plate 3, 38

Figs. 1, 2, ♀ (holotype, **HU.242.R.1**, 727 µm long): fig. 1, RV, ext. lat.; fig. 2, LV, ext. lat.
Scale A (100 µm; × 135), figs. 1, 2.

Remarks: *I. taprobanensis* is unlikely to be confused with other *Ilyocypris* species on the basis of shell form. It is not close to species of the genus whose limbs and soft parts are known although the furcal claws resemble those of *Ilyocypris divisa* Klie in their slenderness. From that species it is easily differentiated by the form of the male clasping limbs (fifth pair of limbs) and the broader, proximal expansion of the furcal ramus.

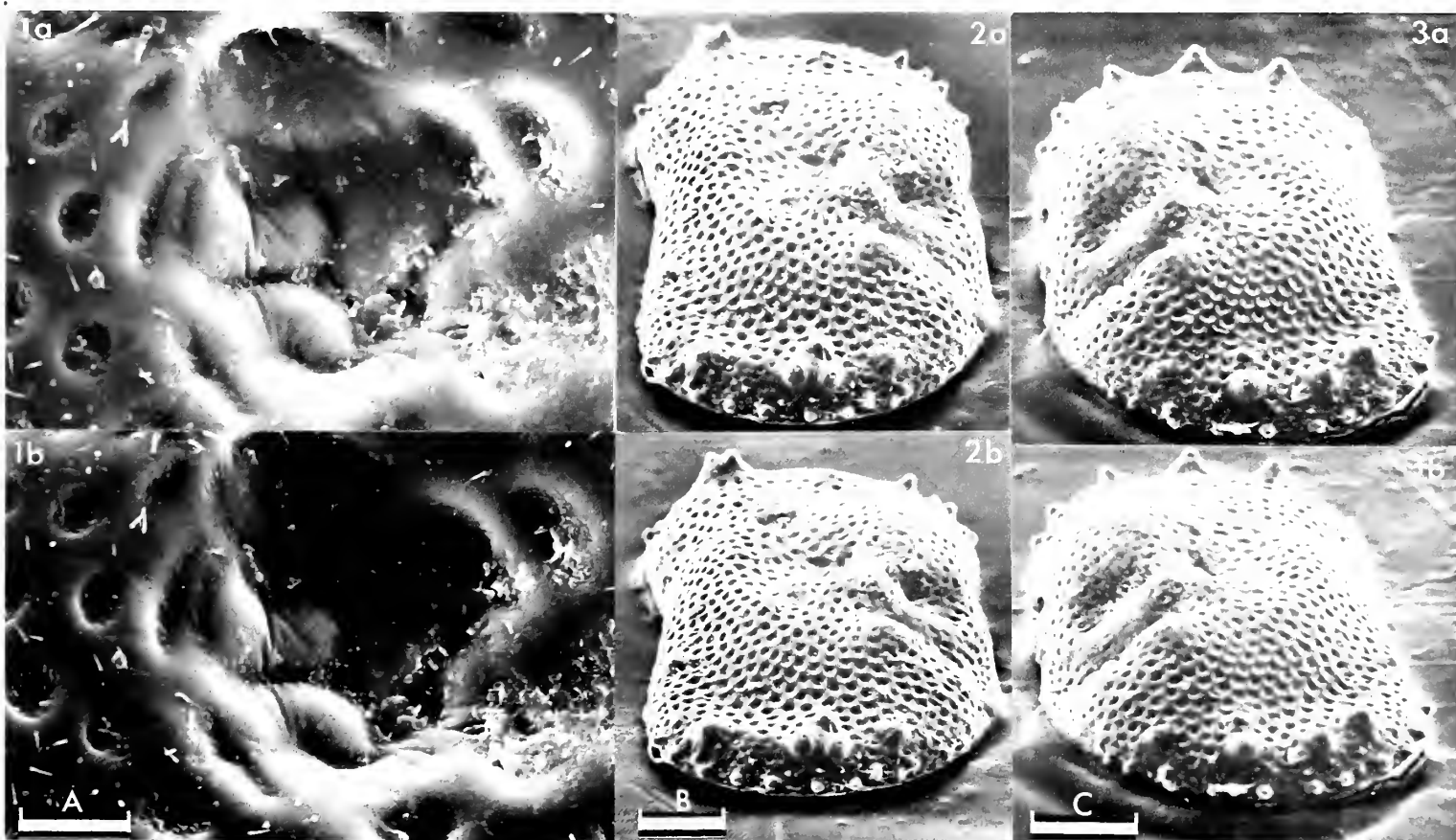
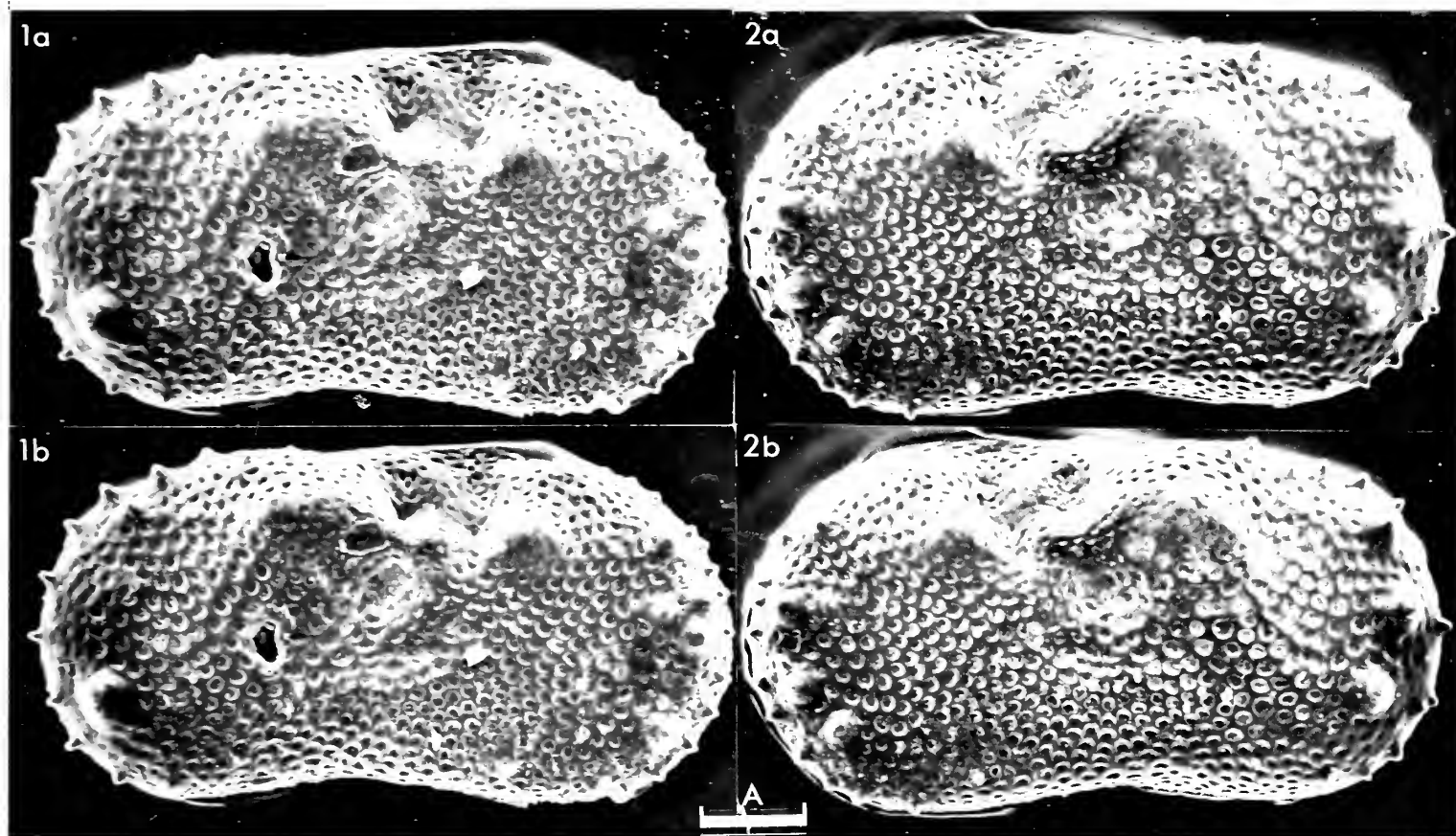
Distribution: So far this species is only known from the Battuluoya area of western Sri Lanka.



Text-fig. 1. ♂ fifth limbs (**HU.242.R.2**).

Explanation of Plate 3, 40

Figs. 1–3, ♀ (holotype, **HU.242.R.1**): fig. 1, LV, ext. lat., musc. sc.; fig. 2, RV, ant. obl.; fig. 3, LV, ant. obl.
Scale A (20 µm; × 750), fig. 1; scale B (100 µm; × 129), fig. 2; scale C (100 µm; × 137), fig. 3.



ON *RADIMELLA DICTYON* POKORNÝ

by Richard H. Benson
(Smithsonian Institution, Washington, D.C., U.S.A.)

Genus *RADIMELLA* Pokorný, 1968

Type-species (by original designation): *Radimella dictyon* Pokorný, 1968.

Diagnosis: A robustly ornate hemicytherine with distinctive reticular pattern; three frontal, divided adductor scars; amphidont hinge with ventrally incised posterior tooth and auxiliary denticles. Three parallel ridges of reticulum extending from muscle node forward; diagonal ridges forming posterodorsal loop with median ridges that become less well organized toward posterior (see Text-fig. 3).

Radimella dictyon Pokorný, 1968

1968 *Radimella dictyon* sp. nov. V. Pokorný, *Acta Univ. Carolinae geol.* 1968, 365-368, text-figs. 1-6.

1969 *Radimella dictyon* Pokorný; V. Pokorný, *Acta Univ. Carolinae geol.* 1969, 296, pl. 1, fig. 1, pl. 4, fig. 2.

Holotype: U.S.N.M. coll. no. **122091**, RV.

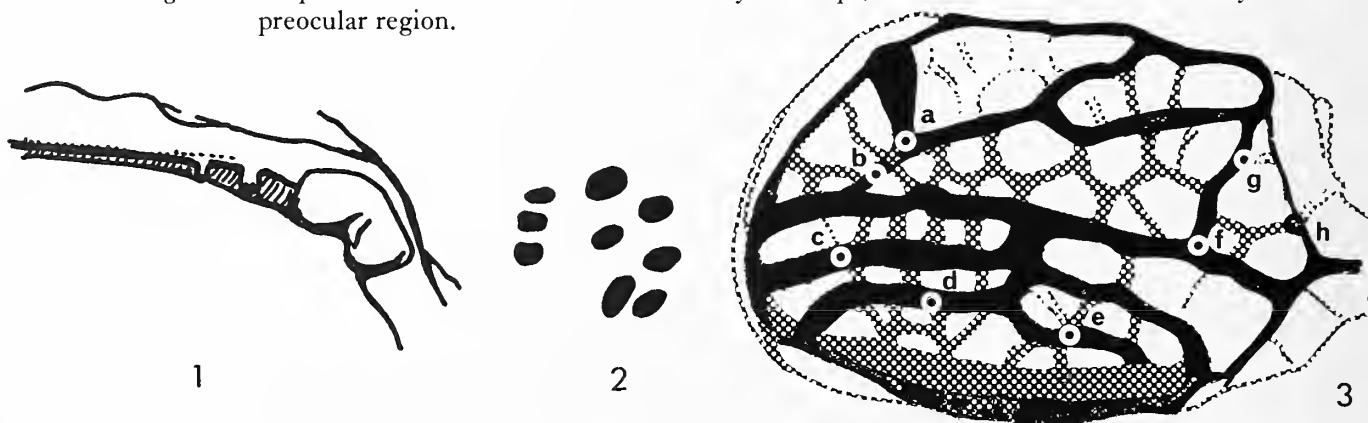
Explanation of Plate 3, 42

Figs. 1, 2, LV (122112, 700 μ m long): fig. 1, ext. lat.; fig. 2, int. lat.
Scale A (250 μ m; \times 130), figs. 1, 2.

Type locality: Galápagos Islands; N of Isla Española (Hood Island); Albatross station no. 2813, lat. 01°1'S, long. 89°40'W, depth 40 fathoms, surface temperature 81°F.

Figured specimens: U.S.N.M. coll. no. **122112** (LV: Pl. 3, 42, figs 1, 2; Pl. 3, 44, figs. 2, 3) and **122091** (RV: Pl. 3, 44, fig. 1). Both Recent from type locality.

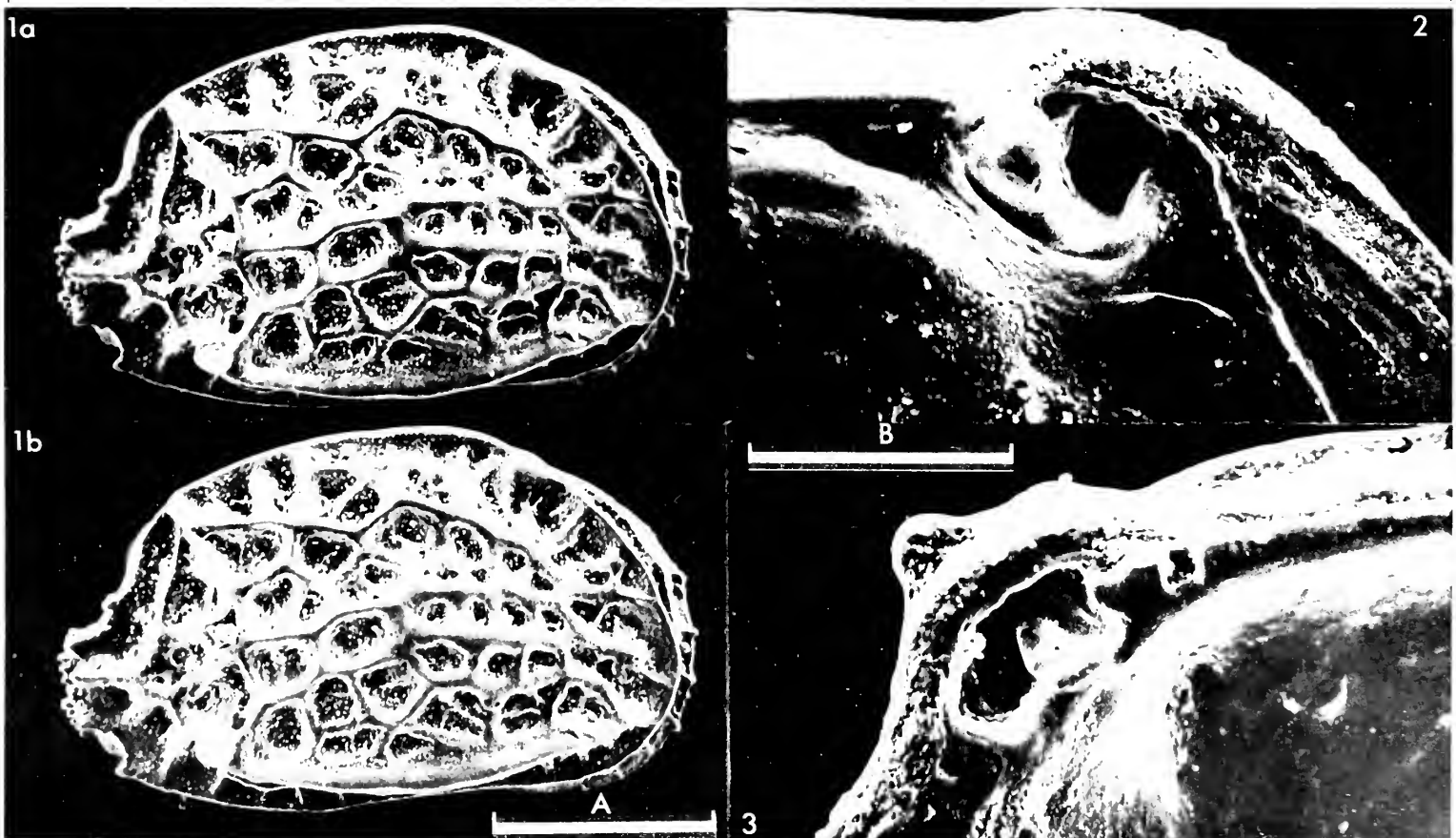
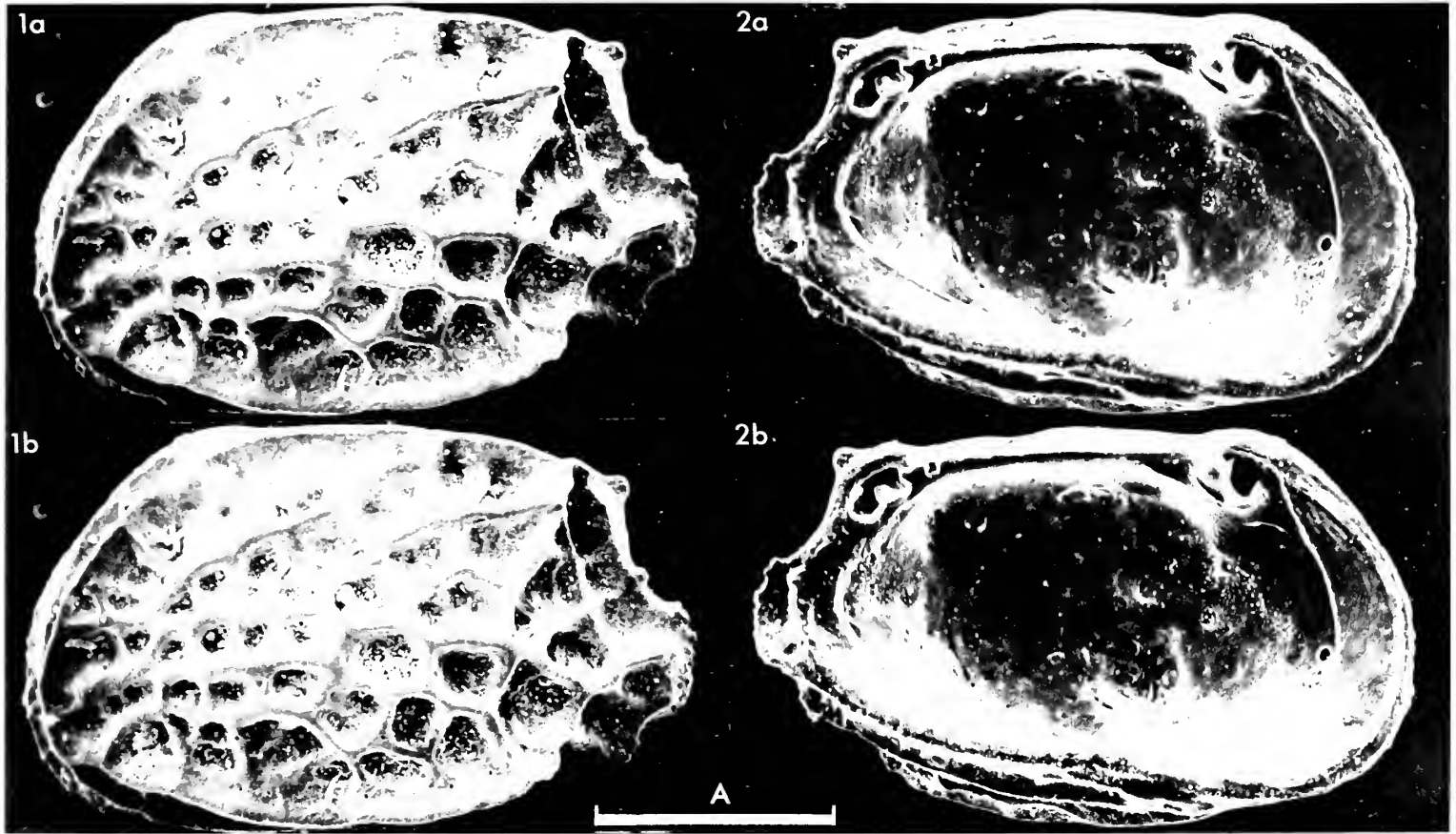
Diagnosis: A species of *Radimella* with a uniformly developed reticulum and with secondary muri in the preocular region.



Text-figs. 1-3, *R. dictyon*. 1, post. element RV hinge, \times 200; 2, adductor musc. sc. pattern, \times 200; 3, LV reticular diagram (modified after Pokorný 1968) with homologous series of pore conuli (a-h), \times 120.

Explanation of Plate 3, 44

Fig. 1, RV, ext. lat. (holotype, **122091**, 730 μ m long); fig. 2, LV ant. hinge, int. lat. (**122112**); fig. 3, LV post. hinge, int. lat. (**122112**).
Scale A (250 μ m; \times 120), fig. 1; scale B (100 μ m; \times 360), figs. 2, 3.



ON *RADIMELLA DARWINI* POKORNÝ

by Richard H. Benson
(Smithsonian Institution, Washington, D.C., U.S.A.)

Radimella darwini Pokorný, 1969

1969 *Radimella darwini darwini* subsp. nov. V. Pokorný, *Acta Univ. Carolinae geol.* 1969, 297–299, pl. 1, fig. 2, text-figs. 1 a–d, 3, 12.

1969 *Radimella darwini dictyonoides* subsp. nov. V. Pokorný, *ibid.*, 299–301, pl. 2, fig. 2, text-figs. 5, 6, 10, 11.

Holotype: U.S.N.M. coll. no. 122097.

Type locality: Galápagos Islands; N of Isla Española (Hood Island); lat. 01°1'S, long. 89°40'W. Recent, Albatross station no. 2813, depth 40 fathoms, surface temperature 81°F.

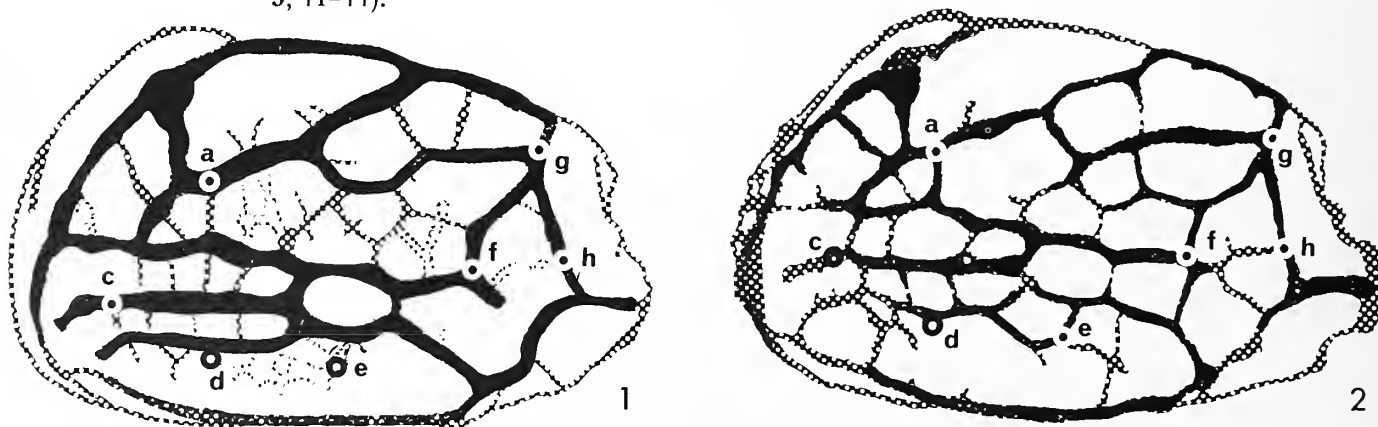
Figured specimens: U.S.N.M. coll. nos. 122097 (LV: Pl. 3, 46, figs. 1, 2), 122098 (LV, holotype of *R. darwini dictyonoides*: Pl. 3, 48, figs. 1, 2). 122097 from type locality. 122098 from Galápagos Islands, Anton Bruun Cruise 18B, station 791G (lat. 00°27'S, long. 90°21'W; Recent), depth 100 m.

Diagnosis: Strong difference between primary and secondary ridge systems of reticulum.

Explanation of Plate 3, 46

Figs. 1, 2, *Radimella darwini darwini*, LV (holotype, 122097, 750 µm long): fig. 1, ext. lat.; fig. 2, int. lat.
Scale A (250 µm; × 120), figs. 1, 2.

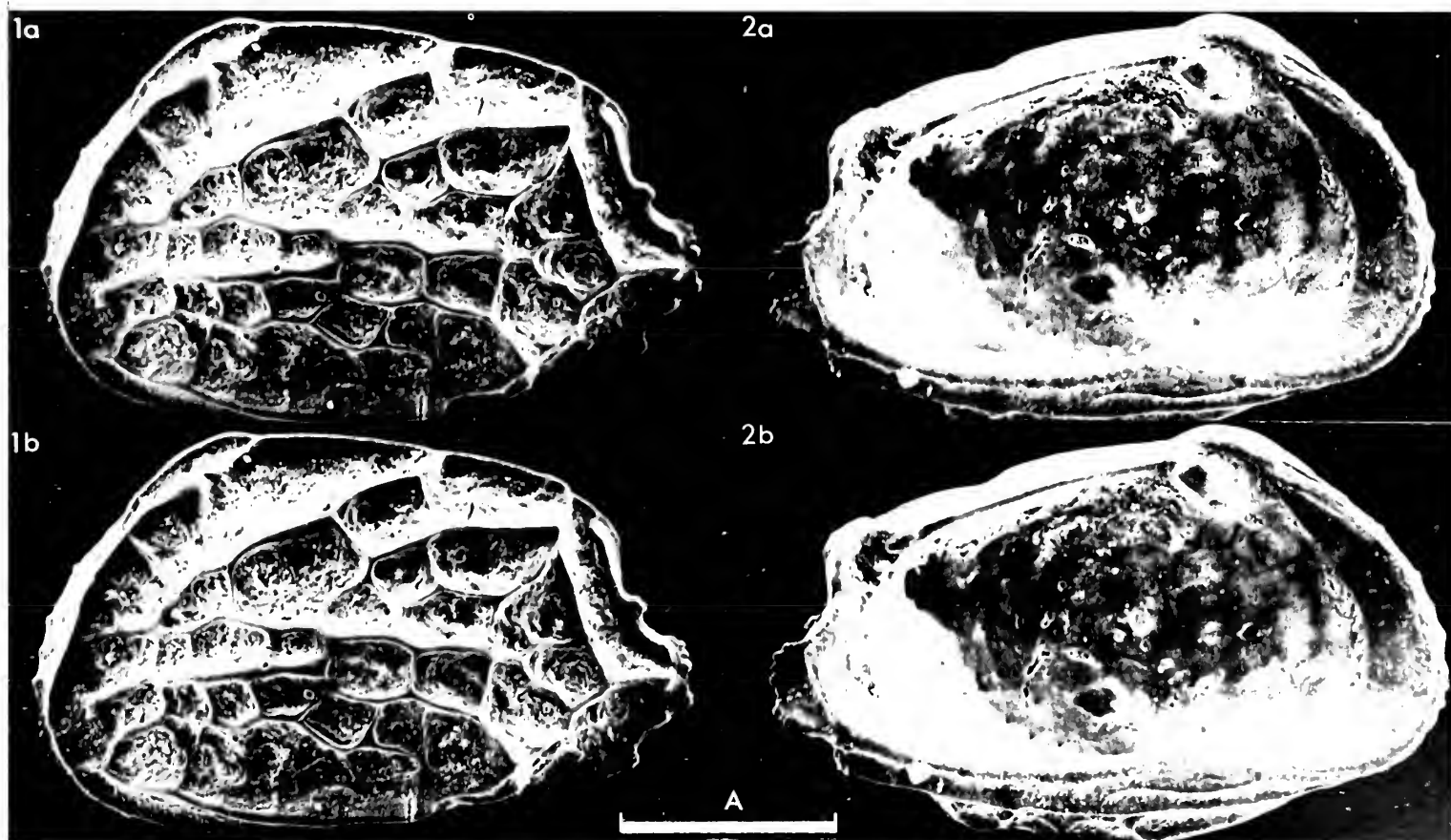
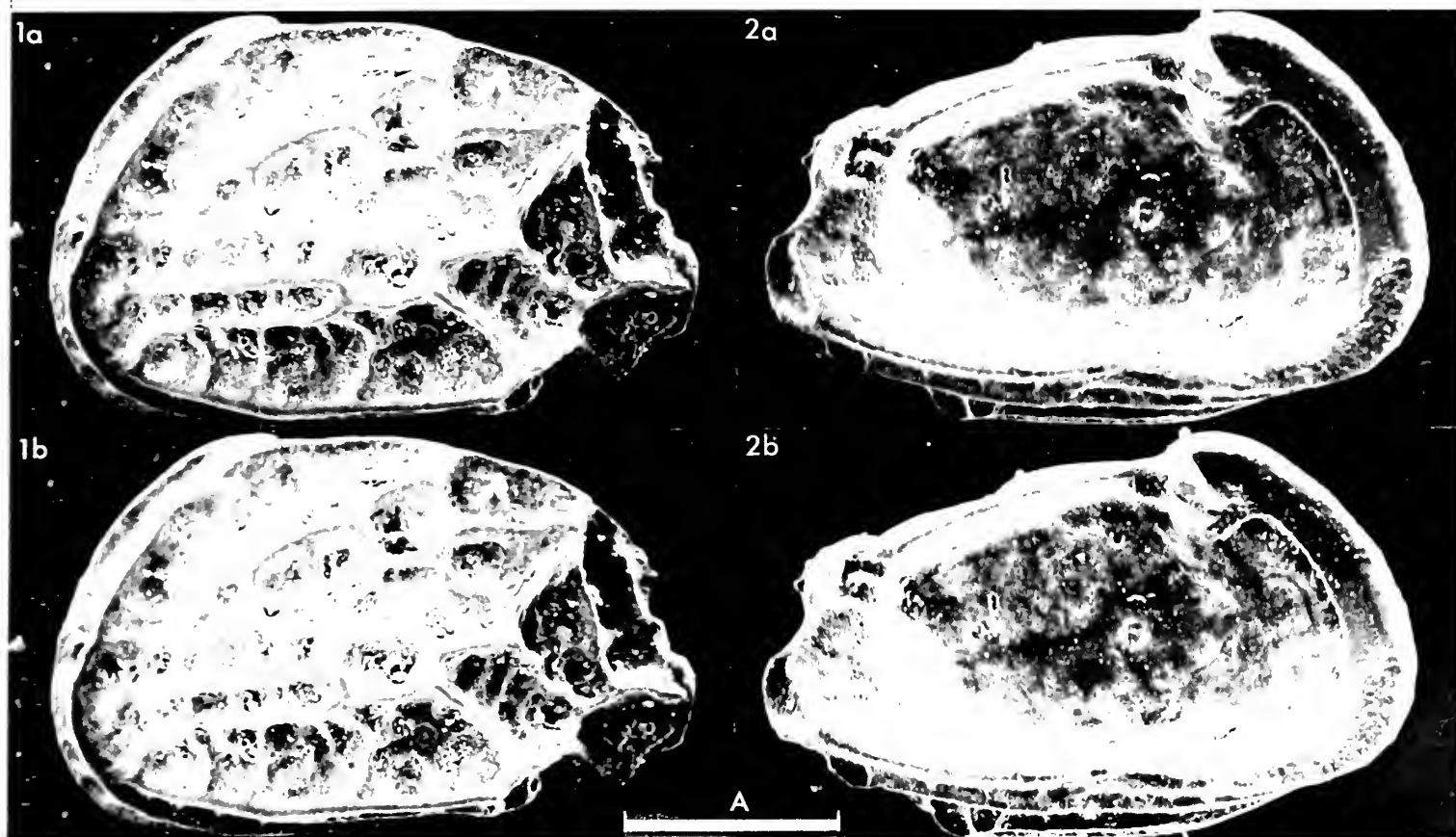
Remarks: Pokorný (op. cit.) recognized two subspecies, *R. darwini darwini* (Pl. 3, 46 and Text-fig. 1) and *R. darwini dictyonoides* (Pl. 3, 48 and Text-fig. 2) differing in strength of the secondary ridge systems, with the latter subspecies approaching *R. dictyon* Pokorný (see *Stereo-Atlas of Ostracod Shells* 3, 41–44).



Text-figs. 1, 2. Reticular diagrams of *R. darwini darwini* (fig. 1) and *R. darwini dictyonoides* (fig. 2) after Pokorný (op. cit.), × 80; a–h, homologous series of pore conuli.

Explanation of Plate 3, 48

Figs. 1, 2, *Radimella darwini dictyonoides*, LV (holotype, 122098, 770 µm long): fig. 1, ext. lat.; fig. 2, int. lat.
Scale A (250 µm; × 117), figs. 1, 2.



ON *RADIMELLA CONFRAGOSA* (EDWARDS)

by Richard H. Benson
(Smithsonian Institution, Washington, D.C., U.S.A.)

Radimella confragosa (Edwards, 1944)

1944 *Hemicythere confragosa* sp. nov. R. A. Edwards, *J. Paleont.* **18**, 518, pl. 86, figs. 23–26.

1971 *Radimella confragosa* (Edwards); J. E. Hazel, *Prof. Pap. U.S. geol. Surv.* **704**, 6.

Holotype: U.S.N.M. coll. no. **559423**, ♀ car.

Type locality: Miocene Duplin, pit on N side of Lumber River and W side of U.S. highway no. 74, SE of Lumberton, North Carolina; lat. 34°37'N, long. 79°00'W.

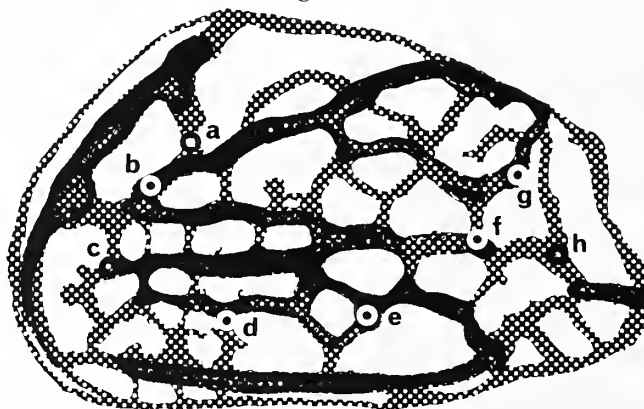
Figured specimens: U.S.N.M. coll. nos. **559423** (♀ car.: Pl. 3, 50, figs. 1, 2; Pl. 3, 52, figs. 3, 4), **172675** (♀ LV: Pl. 3, 52, figs. 1, 2). **172675** from Yorktown Formation, an open pit phosphate mine of the Texas Gulf Sulphur Co., near Aurora, Beaufort County, North Carolina; Lower Pliocene; lat. 35°20'N, long. 76°45'W.

Explanation of Plate 3, 50

Figs. 1, 2, ♀ car. (holotype, **559423**, 580 µm long): fig. 1, LV, ext. lat.; fig. 2, RV, int. lat.
Scale A (200 µm; × 155), figs. 1, 2.

Diagnosis: A species of *Radimella* with massive muri and the posterodorsal loop coincident with the dorsal margin.

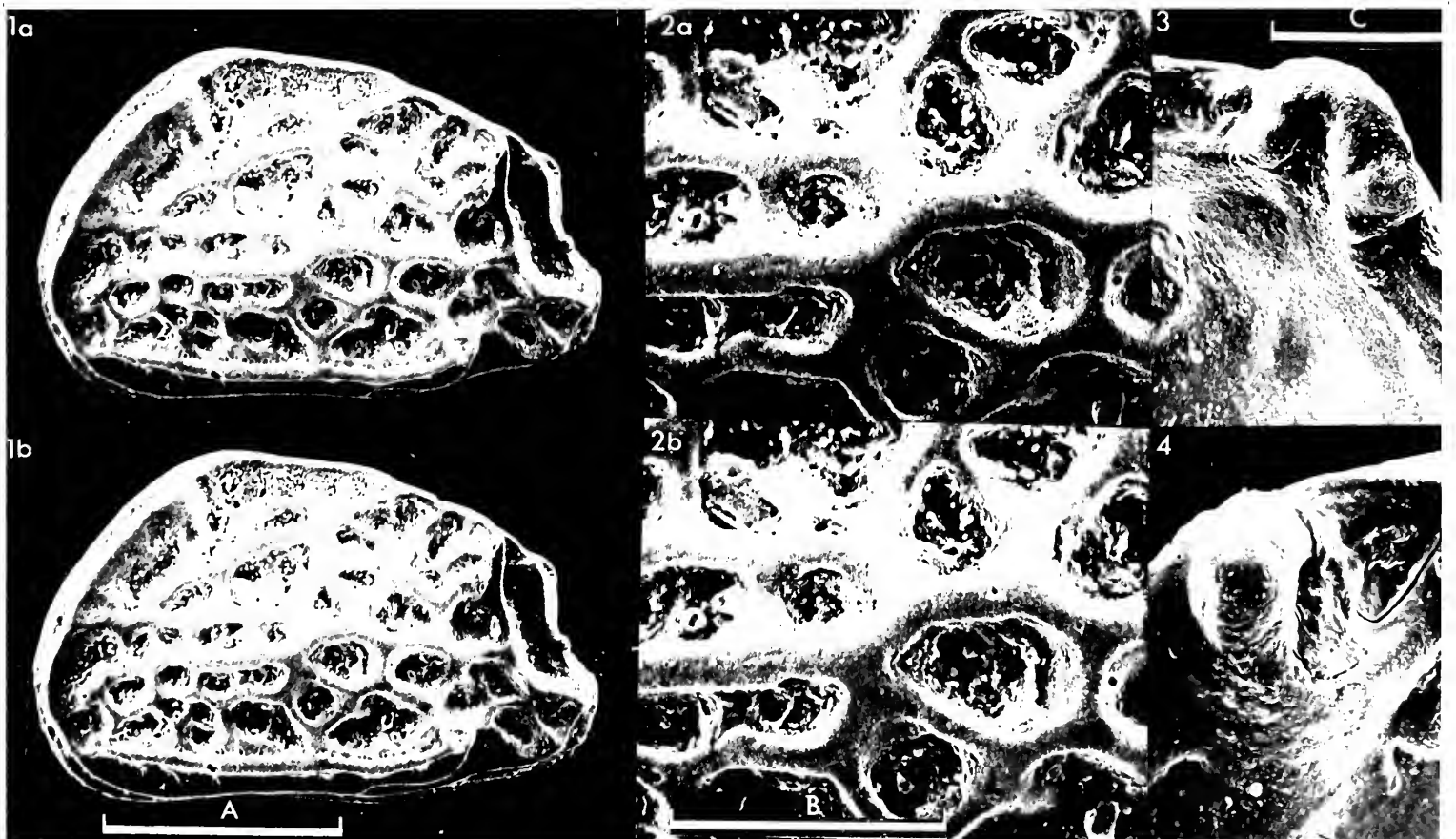
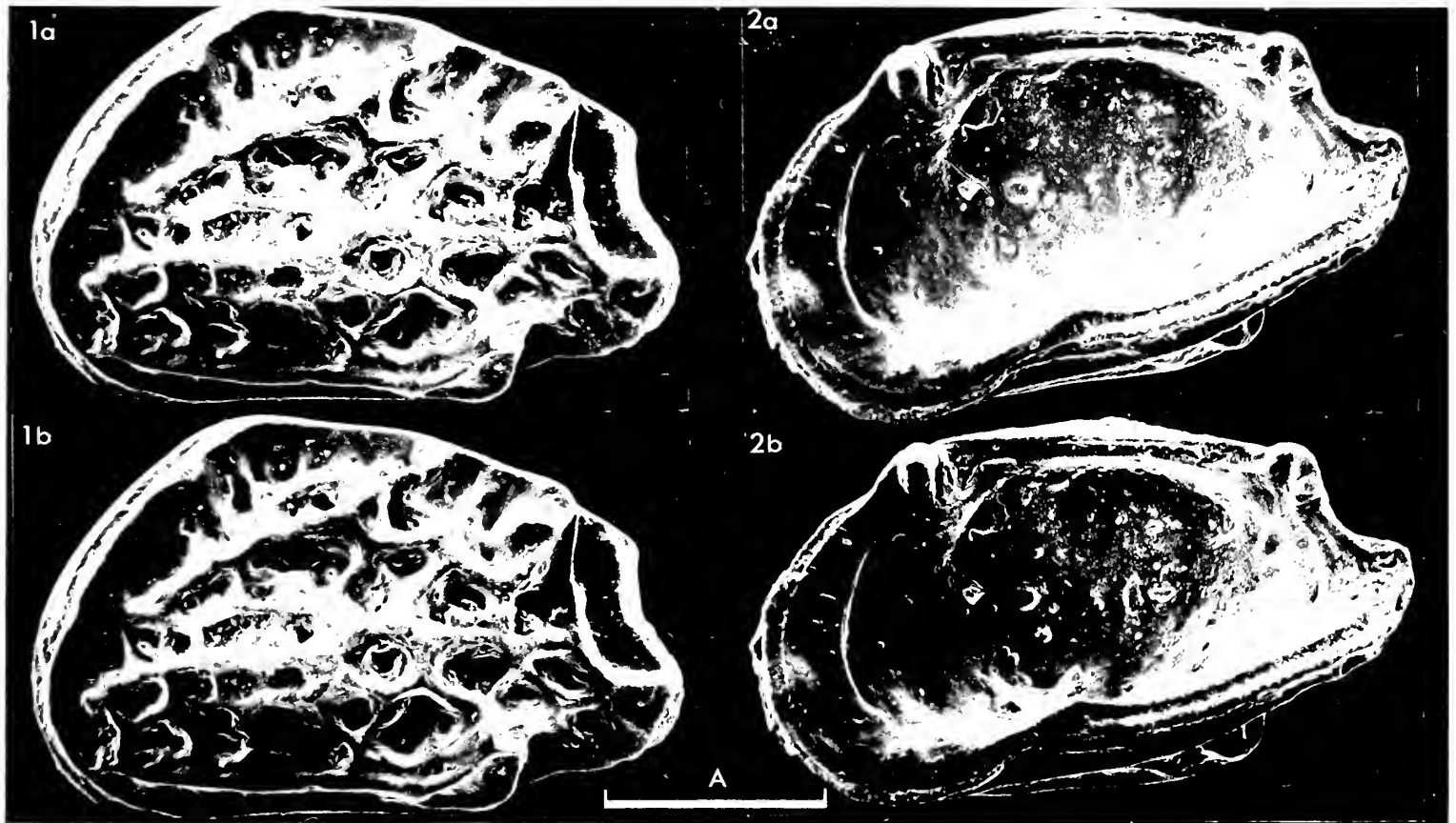
Remarks: Similar to *Radimella ponderosa* Pokorný, 1967 (Recent; Galápagos Islands), whose posterodorsal loop is detached from the dorsal margin.



Text-fig. 1. Reticular diagram; a–h, homologous series of pore conuli, × 150.

Explanation of Plate 3, 52

Figs. 1, 2, ♀ LV (**172675**, 570 µm long): fig. 1, ext. lat.; fig. 2, subcentral tubercle, ext. lat. Figs. 3, 4, ♀ car. (holotype, **559423**): fig. 3, RV int. lat., post. hinge element; fig. 4, RV int. lat., ant. hinge element.
Scale A (250 µm; × 135), fig. 1; scale B (100 µm; × 400), fig. 2; scale C (50 µm; × 500), figs. 3, 4.



ON *RADIMELLA? AURITA* (SKOGSBERG)

by Richard H. Benson
 (Smithsonian Institution, Washington, D.C., U.S.A.)

Radimella? aurita (Skogsberg, 1928)

- 1928 *Cythereis* (*Cythereis*) *aurita* sp. nov. T. Skogsberg, *Occ. Pap. Calif. Acad. Sci.* **15**, 120–126, pl. 6, figs. 5, 6, text-fig. 21.
 1959 *Bradleya aurita* (Skogsberg); R. H. Benson, *Paleont. Contr. Univ. Kans. Arthr.* **1**, 63, pl. 6, figs. 2a–c, pl. 11, fig. 4.
 1972 *Radimella? aurita* (Skogsberg); R. H. Benson, *Smithsonian Contrib. Paleobiol.* **12**, 33.

Syntypes: U.S.N.M. coll. no. **127411**.

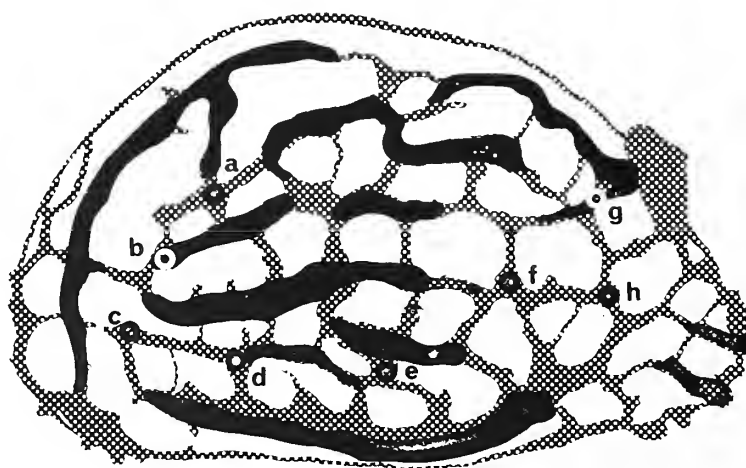
Type locality: Pacific Grove, California, just outside Hopkins Marine Station, in a tide pool; lat. 36°37'N, long. 121°54'W. Recent.

Figured specimens: U.S.N.M. coll. nos. **190450** (♀ LV: Pl. 3, 54, figs. 1, 3), **190446** (♀ RV: Pl. 3, 54, fig. 2), **190106** (♀ car.: Pl. 3, 56, figs. 1–3). **190450** and **190446** both Recent from Todos Santos Bay, Baja California, Mexico; lat. 38°41'N, long. 116°40'W, 15 fathoms. **190106** Recent from Bird Rock (beach wash), La Jolla, California; lat. 32°51'N, long. 117°16'W.

Explanation of Plate 3, 54

Fig. 1, ♀ LV, ext. lat. (**190450**, 860 µm long); fig. 2, ♀ RV, int. lat. (**190446**, 840 µm long); fig. 3, ♀ LV, ext. lat., subcentral tubercle (**190450**).

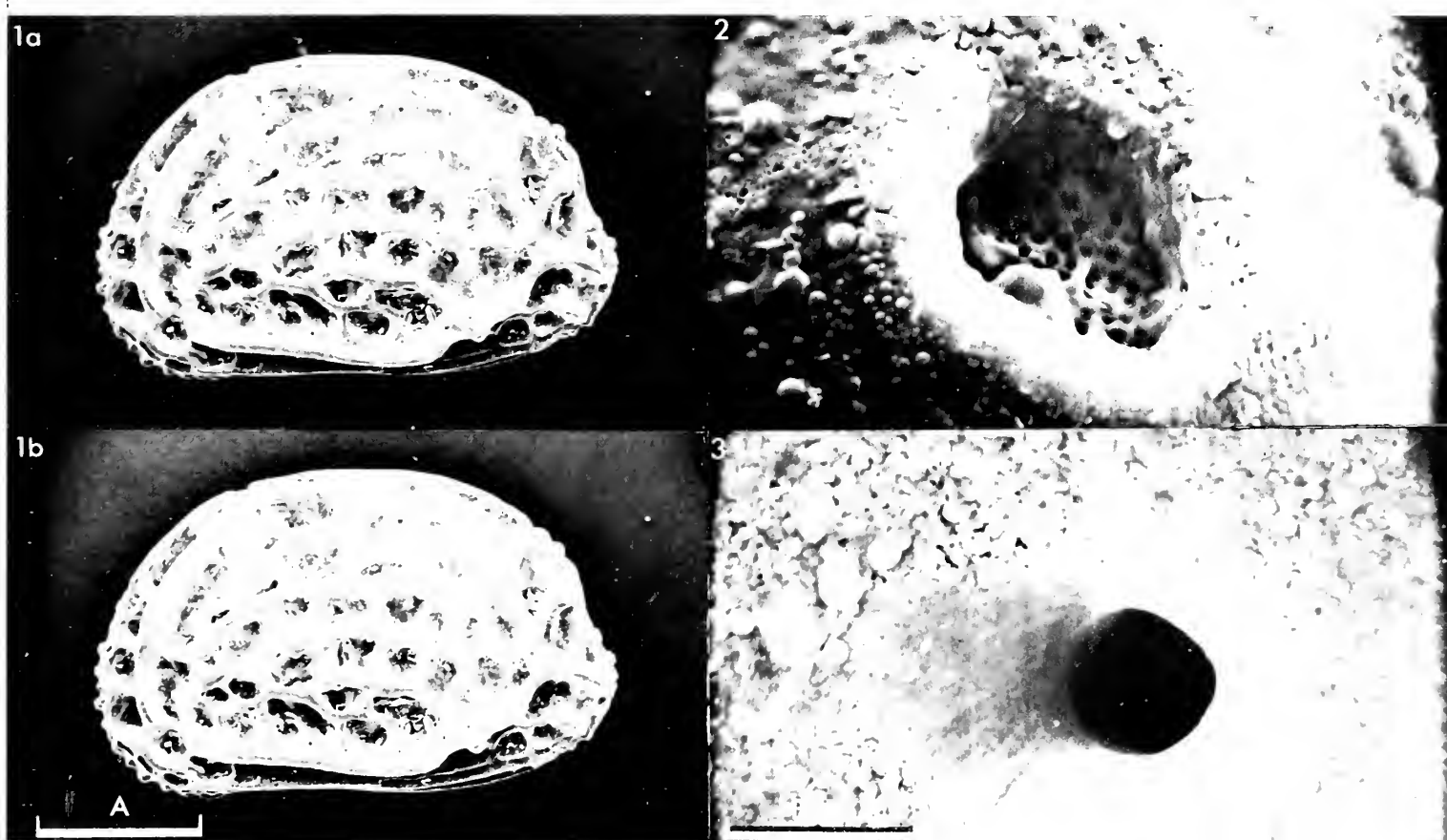
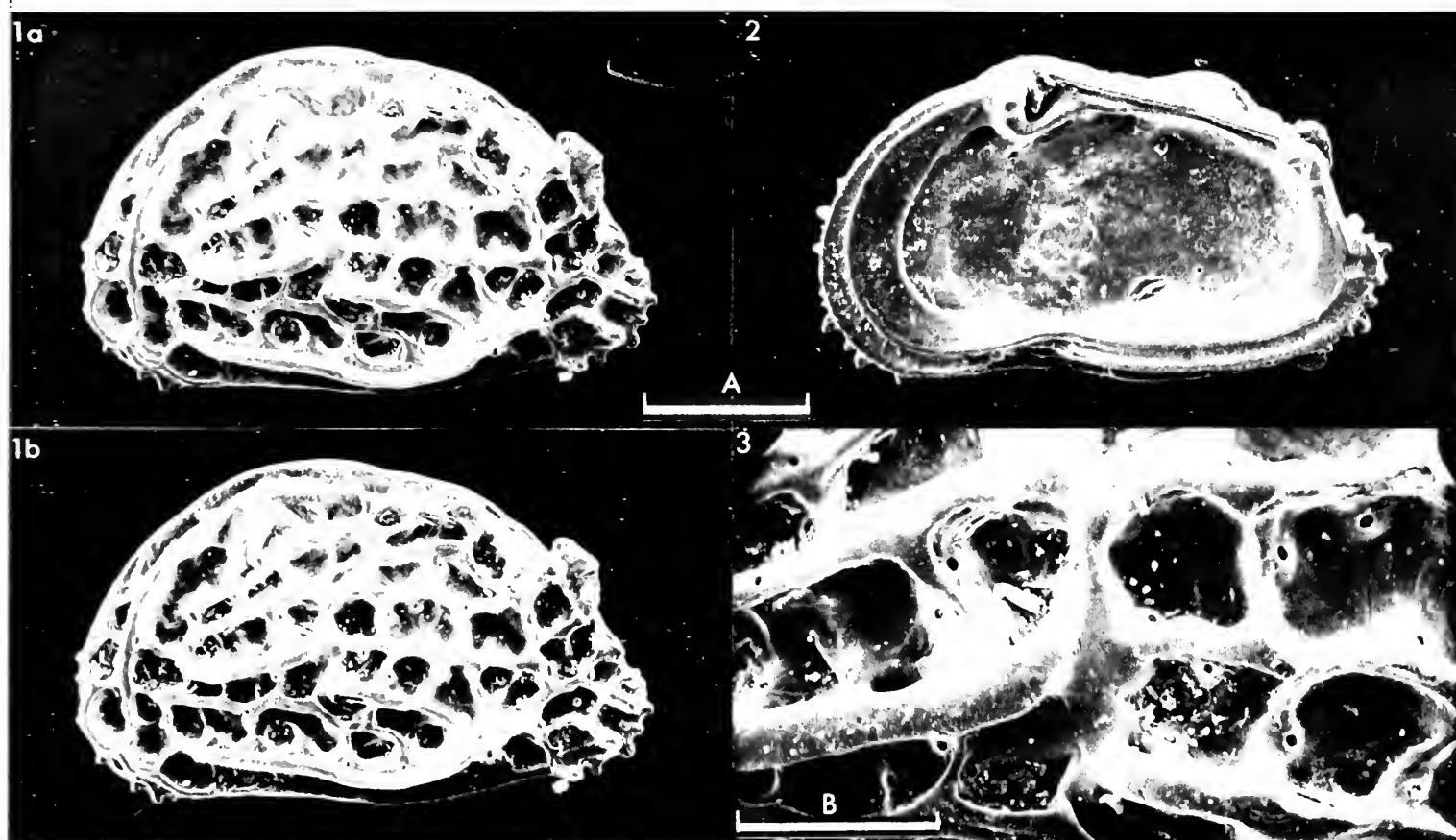
Scale A (250 µm; × 92), figs. 1, 2; scale B (100 µm; × 275), fig. 3.



Text-fig. 1. Reticular diagram; a–h, homologous series of pore conuli.

Explanation of Plate 3, 56

Figs. 1–3, ♀ car. (**190106**, 780 µm long): fig. 1, ext. lt. lat.; fig. 2, pore with sieve plate; fig. 3, disjunctive mural pore.
 Scale A (250 µm; × 92), fig. 1; scale B (5 µm; × 5000), figs. 2, 3.



ON *RADIMELLA? FLORIDANA* (BENSON & COLEMAN)

by Richard H. Benson
(Smithsonian Institution, Washington, D.C., U.S.A.)

Radimella? floridana (Benson & Coleman, 1963)

- 1963 *Aurila conradi floridana* subsp. nov. R. H. Benson & G. L. Coleman, *Paleont. Contr. Univ. Kans. Arthr.* 2, 35, 36, pl. 8, figs. 10-12, text-fig. 21.
?1965 *Aurila conradi littoralis* subsp. nov. S. Grossman, *Micropaleontology* 11, 143-146, pl. 1, figs. 1-11.
1966 *Aurila conradi floridana* Benson & Coleman; R. H. Benson, *J. Paleont.* 40, 746.
1971 *Aurila floridana* Benson & Coleman; P. C. Valentine, *Prof. Pap. U.S. geol. Surv.* 683-D, tab. 1, pl. 7, figs. 43-47.

Lectotype: U.S.N.M. coll. no. 113202; designated Benson 1966, op. cit.

Type locality: Western end of Florida Bay in waters about 4 fathoms deep. Lat. 24°55'N, long. 80°55'W.

Figured specimens: U.S.N.M. coll. nos. 172654 (♀ LV: Pl. 3, 58, figs. 1-4), 190513 (♀ RV: Pl. 3, 60, figs. 1-3). 172654 Recent from Gosnold station 1845 (shelf off Onslow Bay, lat. 33°59.5'N, long. 76°29.3'W, depth 41 m); 190513 Recent from Gosnold station 1474 (shelf off South Carolina, lat. 32°49.3'N, long. 78°44.4'W, depth 32 m).

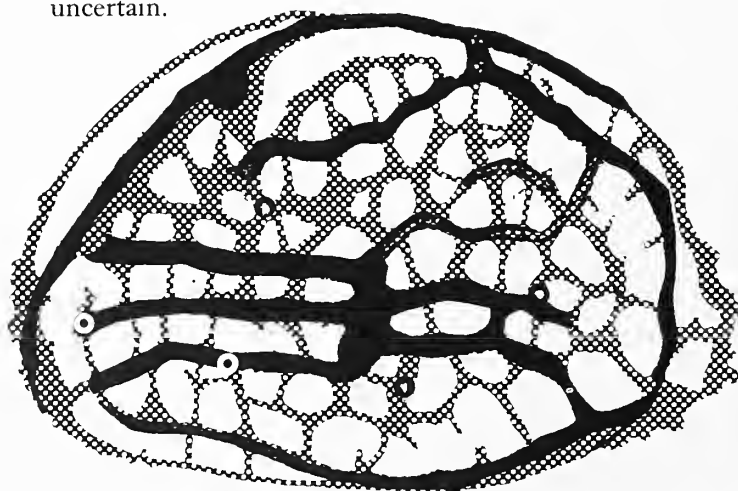
Explanation of Plate 3, 58

Figs. 1-4, ♀ LV (172654; 700 µm long); fig. 1, ext. lat.; fig. 2, ext. lat., subcentral tubercle; fig. 3, disjunctive mural pore; fig. 4, pore with sieve plate.

Scale A (250 µm; × 115), fig. 1; scale B (100 µm; × 350), fig. 2; scale C (5 µm; × 5000), figs. 3, 4.

Diagnosis: Possibly a species of *Radimella* with the fossae divided by secondary reticulation and an inner posterior rim developed just in from the margin extending from the ventrolateral ridge.

Remarks: Probably conspecific with *Aurila conradi littoralis* Grossman, 1965, from the Recent of Radfish Bay, Texas coast, though doubt about the reticular pattern of that form makes absolute assignment uncertain.



1



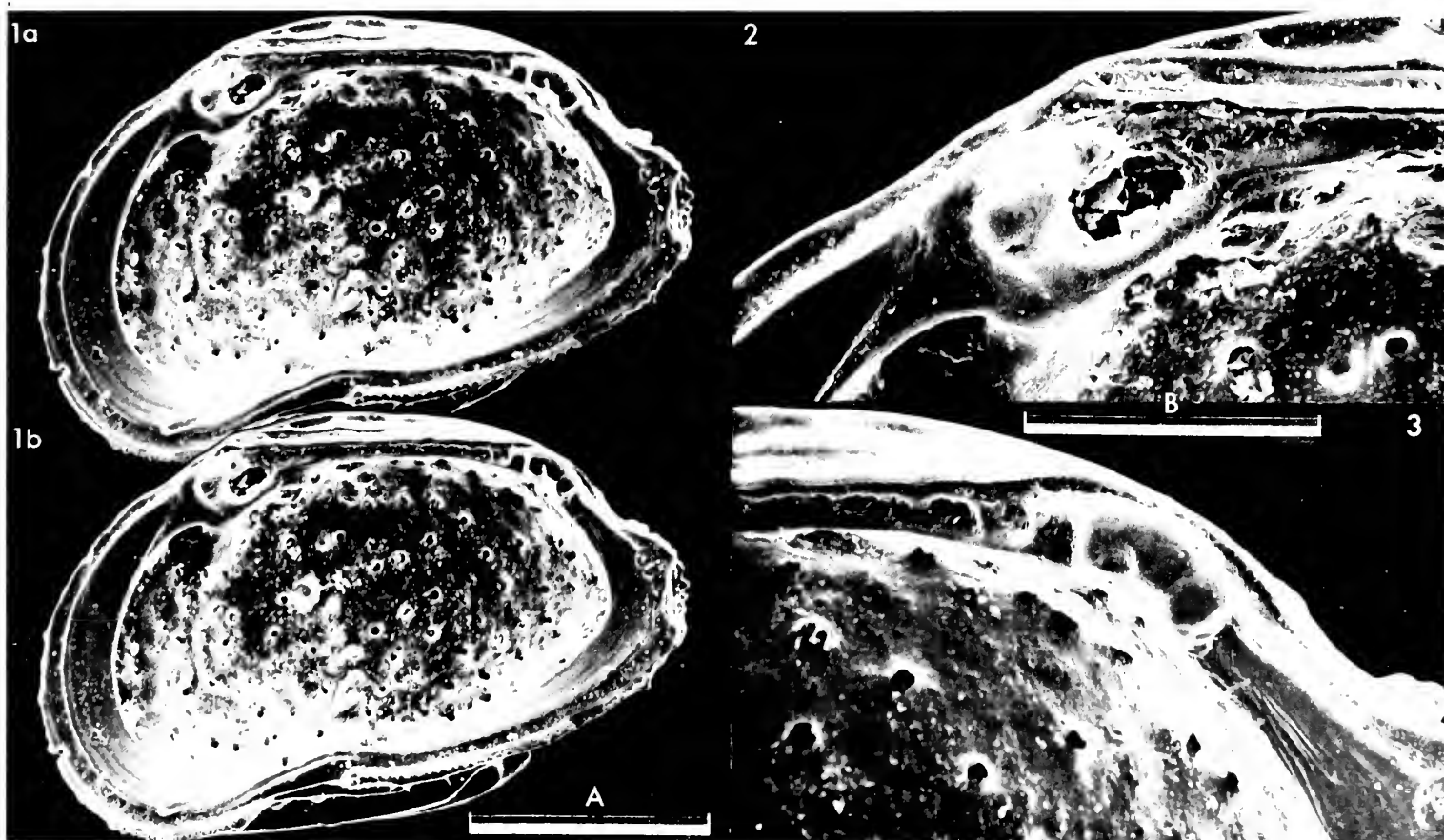
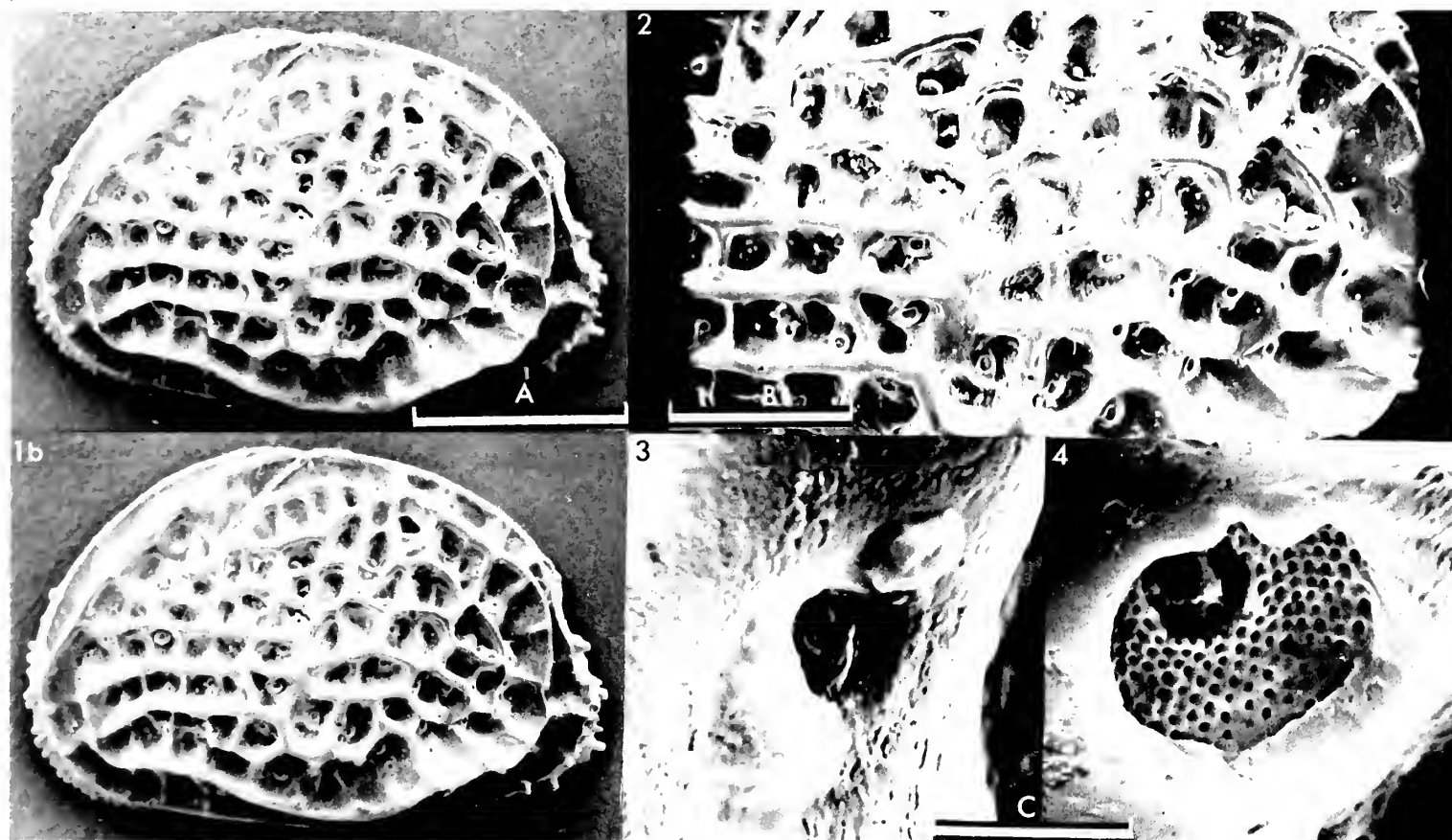
2

Text-fig. 1. LV reticular diagram, modified after Pokorný (*Acta Univ. Carolinae geol.*, 1968).

Text-fig. 2. RV int. lat. musc. sc.

Explanation of Plate 3, 60

Figs. 1-3, ♀ RV (190513, 690 µm long): fig. 1, int. lat.; fig. 2, ant. hinge element; fig. 3, post. hinge element.
Scale A (250 µm; × 133), fig. 1; scale B (100 µm; × 400), figs. 2, 3.



ON *CYTHERELLA* (*CYTHERELLOIDEA*) *PETROSA* DORUK sp. nov.

by Neriman Doruk
(University of Leicester, England)

Cytherella (*Cytherelloidea*) *petrosa* sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) **IO 5771**, ♂ LV.

Type locality: A road section 2 km S of Salbaş, Adana area of Turkey; approx. lat. 37°07'N, long. 35°08'E. Tortonian (Upper Miocene); yellow sandstone with abundant molluscs and foraminifera. Presumed shallow marine.

Derivation of name: From the Greek 'rocky', with reference to the nature of the surface ornament.

Figured specimens: Brit. Mus. (Nat. Hist.) **IO 5770** (♀ RV: Pl. 3, 62, fig. 1), **IO 5771** (♂ LV: Pl. 3, 62, fig. 2; Pl. 3, 64, fig. 3), **IO 5772** (♀ RV: Pl. 3, 64, figs. 2, 4). The specimen figured in Pl. 3, 64, fig. 1, has been broken since preparation and photography.

Explanation of Plate 3, 62

Fig. 1, ♀ RV, ext. lat. (**IO 5770**, 650 µm long); fig. 2, ♂ LV, ext. lat. (holotype, **IO 5771**, 630 µm long).
Scale A (250 µm; × 131), fig. 1; scale B (250 µm; × 137), fig. 2.

Figured specimens: **IO 5770** and **IO 5771** from type locality, 7 m from the base and at the base of the section respectively.
(*contd.*) **IO 5772** from a road section, 4 m from the base, 1 km N of Salbaş, Turkey; approx. lat. 37°08'N, long. 35°08'E; Tortonian, grey marl with molluscs and foraminifera; presumed shallow marine.

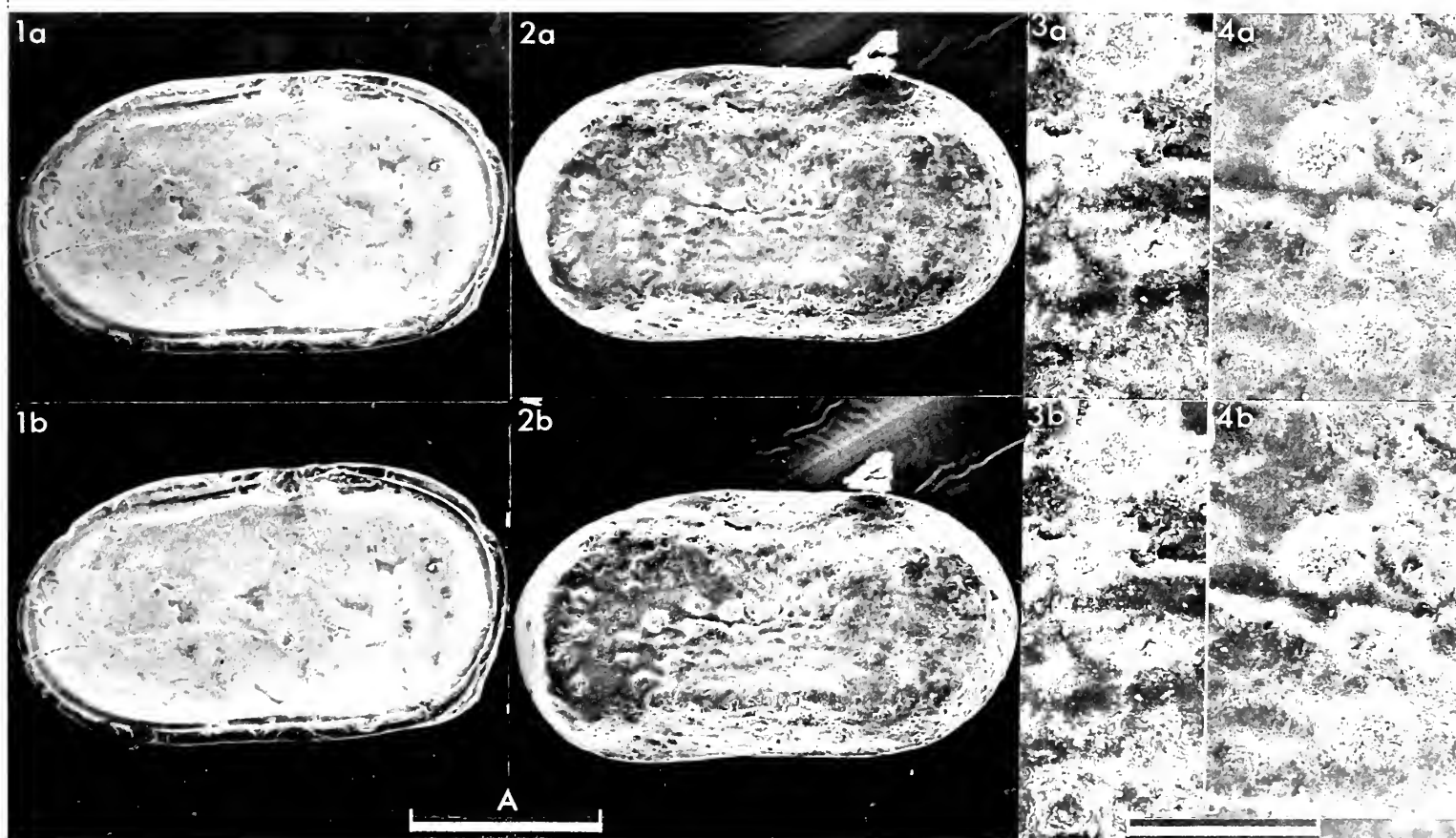
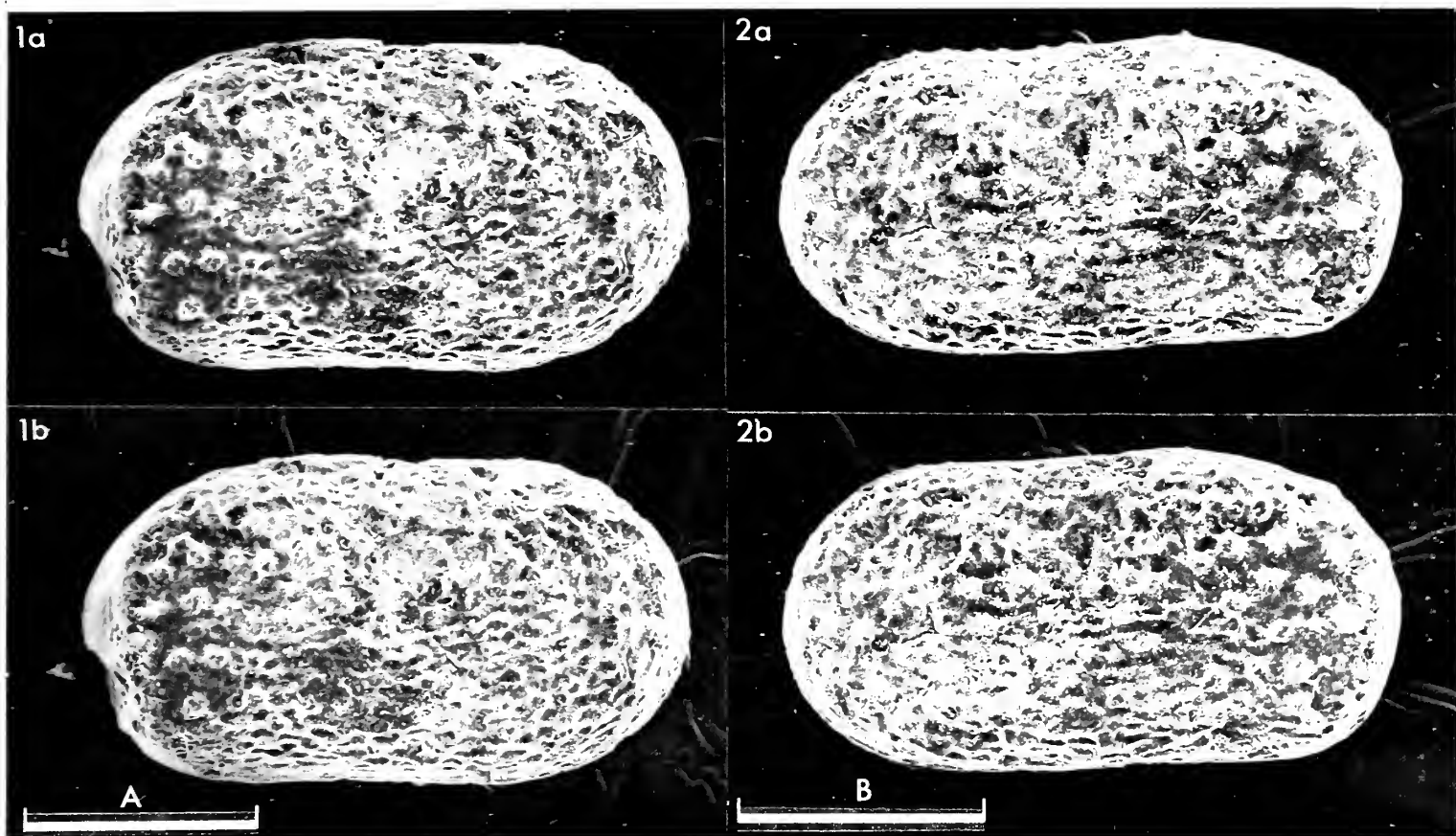
Diagnosis: Steep dorsally; surface nodose and reticulate.

Remarks: Surface variably reticulate and nodulose (see Pl. 3, 64, figs. 2, 4). Sexual dimorphism: males more elongate (see Pl. 3, 62, figs. 1, 2).

Distribution: Known as yet only from the Upper Miocene near Salbaş in the Adana area of Turkey.

Explanation of Plate 3, 64

Fig. 1, ♀ RV, int. lat. (broken, 640 µm long); fig. 2, ♀ RV, ext. lat. (**IO 5772**, 640 µm long); fig. 3, ♂ LV, detail of surface ornament (holotype, **IO 5771**); fig. 4, ♀ RV, detail of surface ornament (**IO 5772**).
Scale A (250 µm; × 106), figs. 1, 2; scale B (50 µm; × 548), figs. 3, 4.



ON *CYTHERELLA* (*CYTHERELLOIDEA*) *OCHTHODES* DORUK sp. nov.

by Neriman Doruk
(University of Leicester, England)

Cytherella (*Cytherelloidea*) *ochthodes* sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) IO 5759, ♀ RV.

Type locality: A road section between Babatorun and Com, 1 km SW of Babatorun, Antakya region of Turkey; approx. lat. 36°04'N, long. 36°15'E. Uppermost Miocene; yellow sandstone with molluscan shell fragments. Presumed littoral.

Derivation of name: From the Greek 'hilly', referring to the posterior scarp.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 5759 (♀ RV: Pl. 3, 66, fig. 1; Pl. 3, 68, fig. 2), IO 5760 (♀ LV: Pl. 3, 66, fig. 2; Pl. 3, 68, fig. 1).

Both specimens are from about 15 m above the base of the section at the type locality.

Explanation of Plate 3, 66

Fig. 1, ♀ RV, ext. lat. (holotype, IO 5759, 710 µm long); fig. 2, ♀ LV, ext. lat. (IO 5760, 620 µm long).
Scale A (250 µm; × 115), fig. 1; scale B (250 µm; × 135), fig. 2.

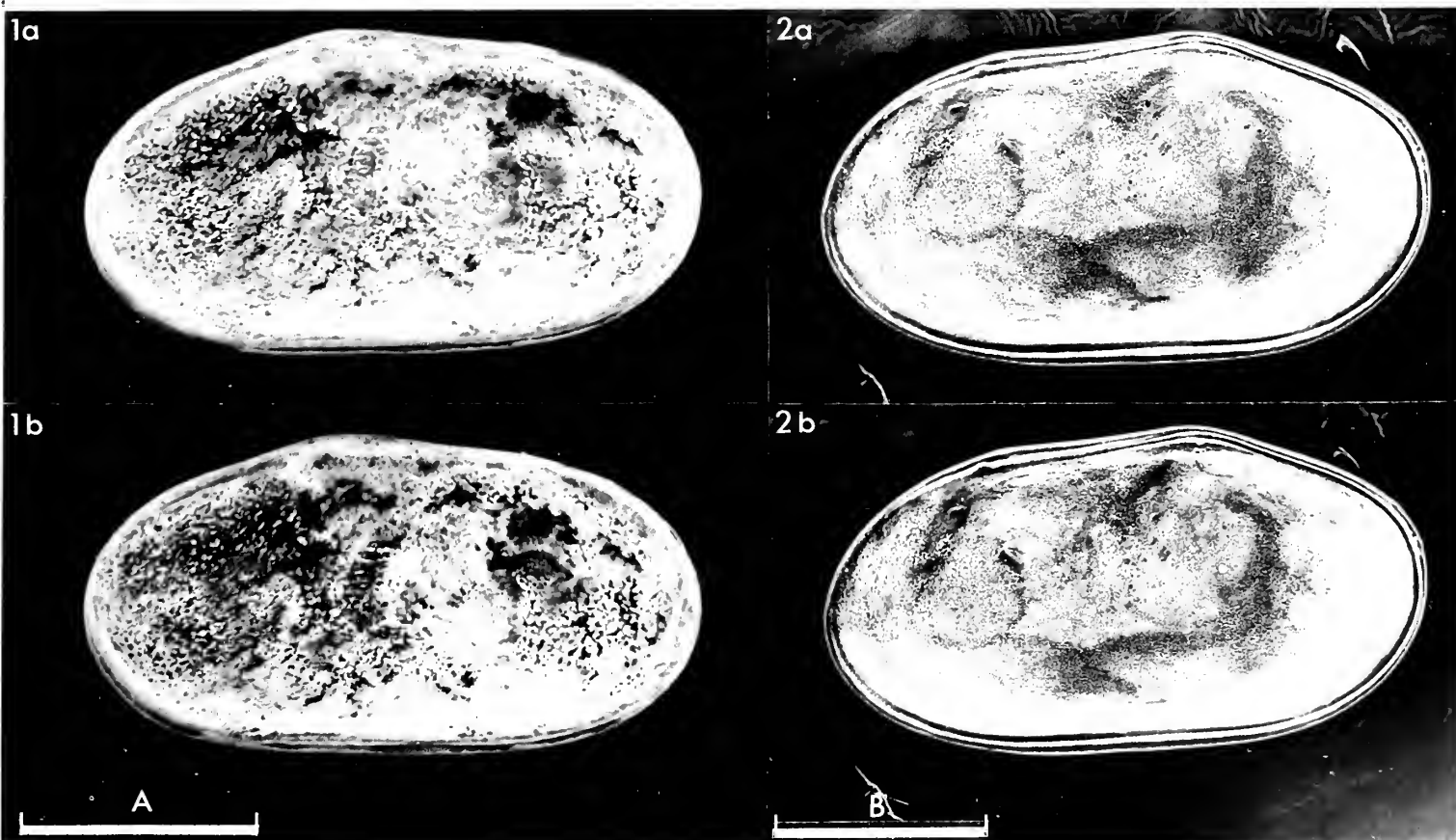
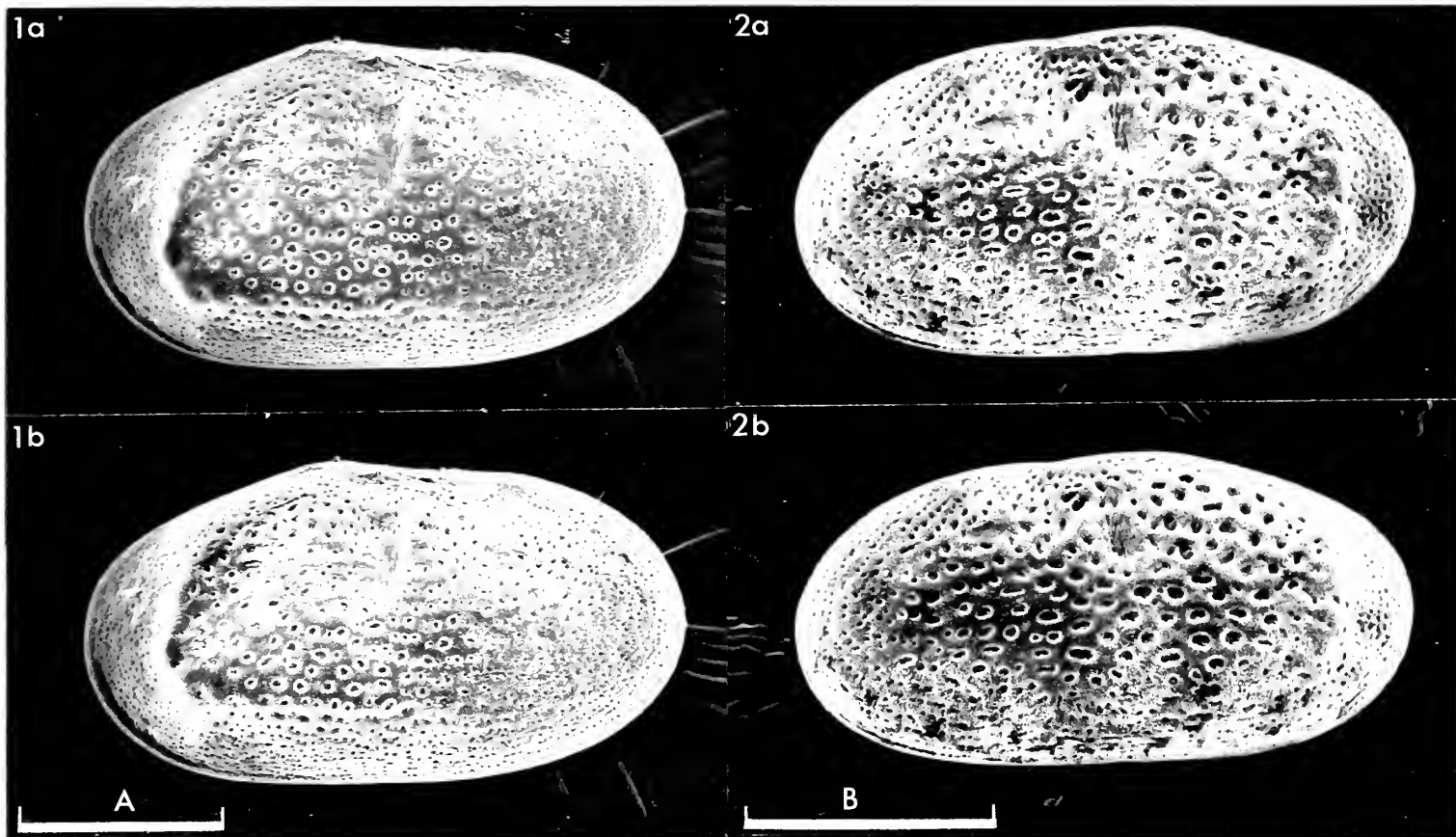
Diagnosis: Foveolate and punctate; posterior scarp inclined with variable and irregular edge.

Remarks: Differs from *Cytherella* (*Cytherelloidea*) *variopunctata* (Lienenklaus) in shape. Variable in size of pits (see Pl. 3, 66, figs. 1, 2). Sexual dimorphism: males a little less high.

Distribution: Known so far only from type locality, Turkey.

Explanation of Plate 3, 68

Fig. 1, ♀ LV, int. lat. (IO 5760); fig. 2, ♀ RV, int. lat. (holotype, IO 5759).
Scale A (250 µm; × 135), fig. 1; scale B (250 µm; × 115), fig. 2.



ON *CYTHERELLA* (*CYTHERELLOIDEA*) *CHOSTA* DORUK sp. nov.

by Neriman Doruk
(University of Leicester, England)

Cytherella (*Cytherelloidea*) *chosta* sp. nov.

Holotype: Brit. Mus. (Nat. Hist.) IO 5766, ♀ RV.

Type locality: A road section 11 km SW of Kuzucubelen, the Mersin area of Turkey; approx. lat. 36°45'N, long. 34°22'E. Lower Miocene; limestone with molluscs, foraminifera and the ostracods *Bythoceratina*, *Bairdia*, *Buntonia* and *Paracypris*. Presumed deep marine.

Derivation of name: From the Greek 'piled up', referring to the fancied resemblance of the papillate ornament to drifts of sand.

Figured specimens: Brit. Mus. (Nat. Hist.) IO 5766 (♀ RV: Pl. 3, 70, figs. 1, 3), IO 5767 (♂ LV: Pl. 3, 70, fig. 2), IO 5768 (♂ LV: Pl. 3, 72, fig. 1), IO 5769 (♀ RV: Pl. 3, 72, figs. 2, 3).
All specimens are from the base of the type section.

Explanation of Plate 3, 70

Fig. 1, ♀ RV, ext. lat. (holotype, IO 5766, 770 µm long); fig. 2, ♂ LV, ext. lat. (IO 5767, 760 µm long); fig. 3, ♀ RV, ext. lat., detail of papillate ornament (holotype, IO 5766).
Scale A (250 µm; × 105), fig. 1; scale B (250 µm; × 107), fig. 2; scale C (20 µm; × 1050), fig. 3.

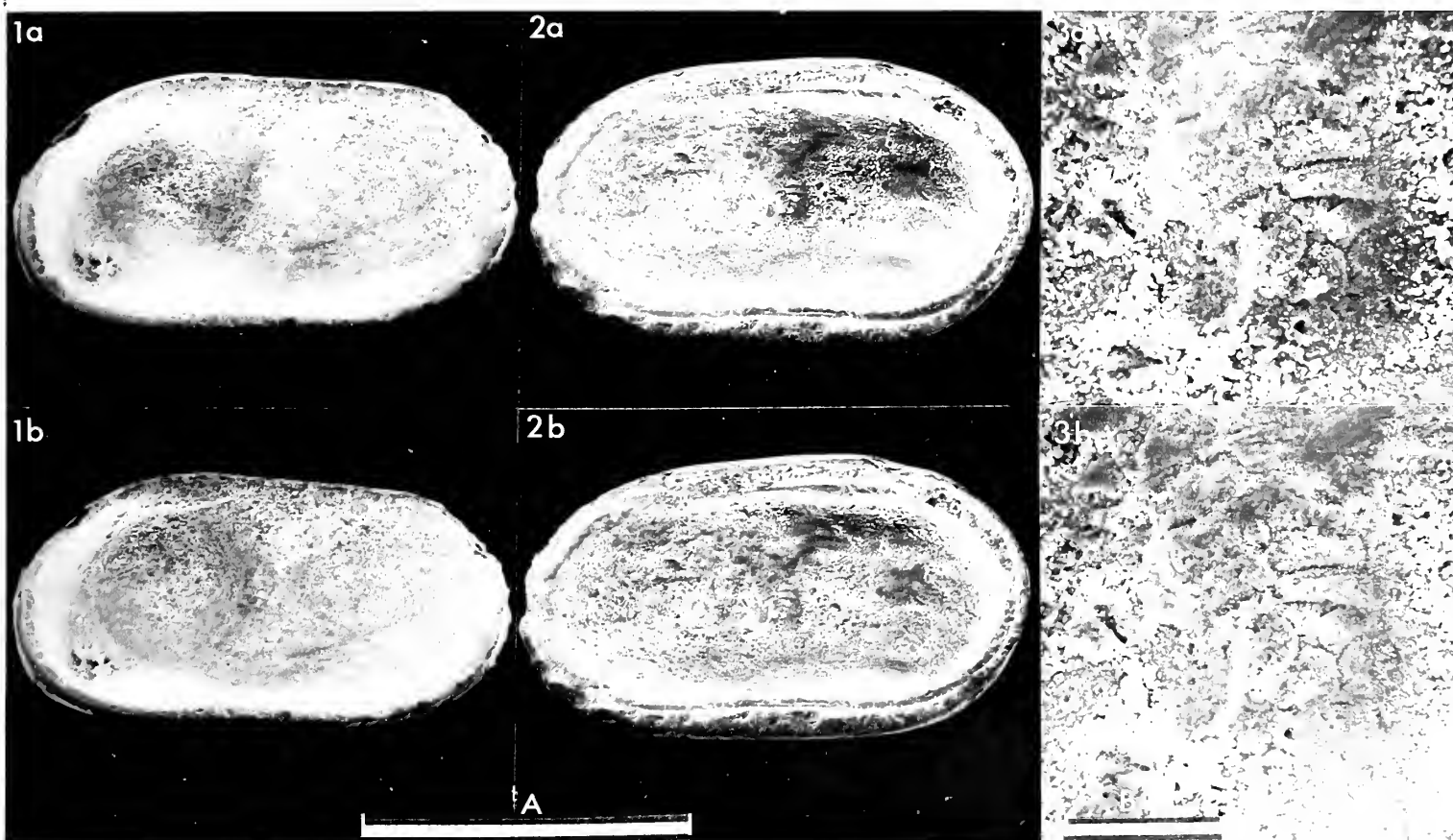
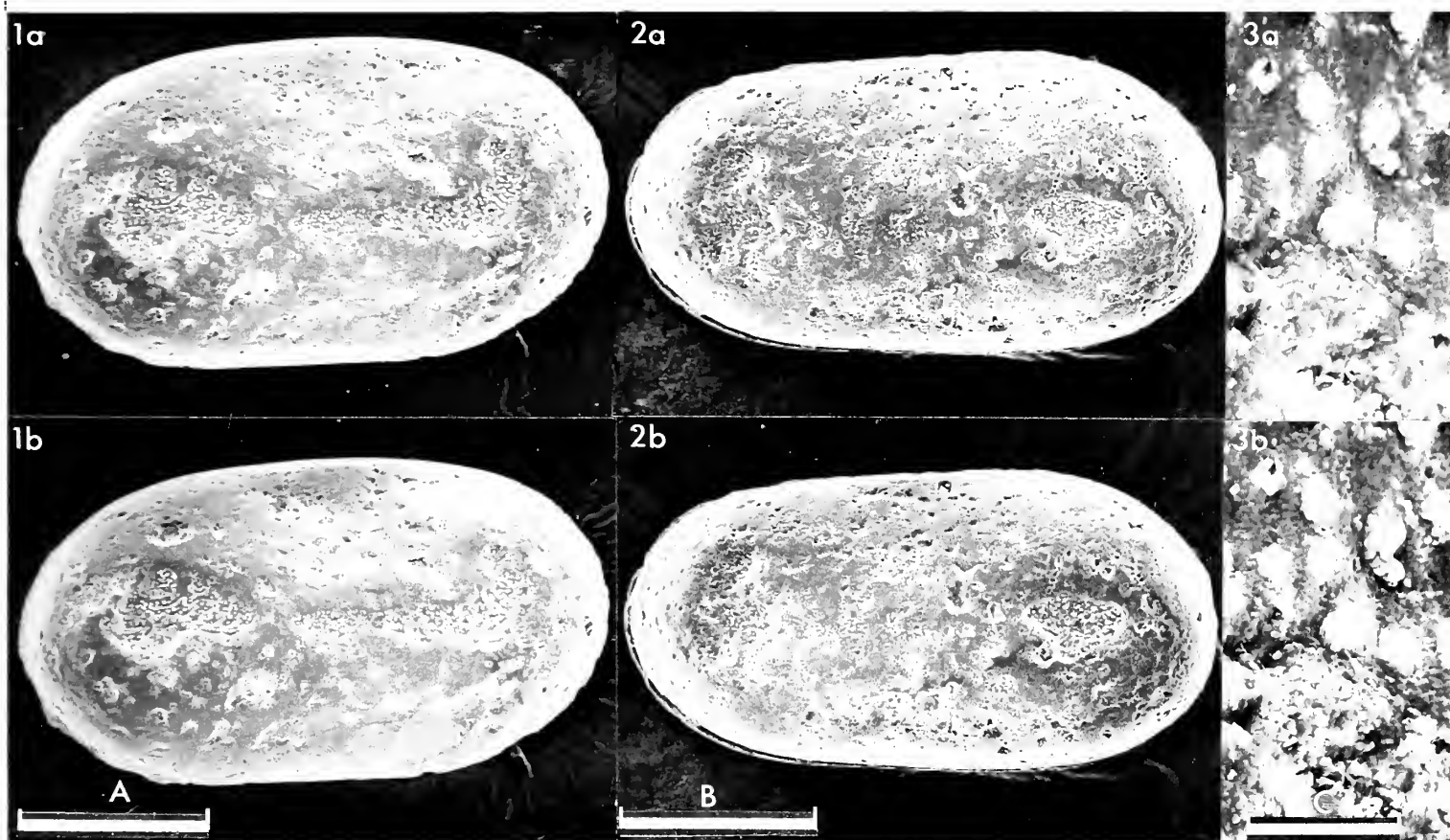
Diagnosis: Carapace oval shaped, surface grooved laterally. Papillate ornament in grooved areas (see Pl. 3, 70, figs. 1–3) is arranged in rows.

Remarks: The extent of the grooved areas is variable. Sexual dimorphism: males less high (see Pl. 3, 70, figs. 1, 2).

Distribution: Known as yet only from the Lower Miocene of the Mersin area of Turkey.

Explanation of Plate 3, 72

Fig. 1, ♂ LV, int. lat. (IO 5768, 755 µm long); fig. 2, ♀ RV, int. lat. (IO 5769, 760 µm long); fig. 3, ♀ RV, int. musc. sc. (IO 5769).
Scale A (500 µm; × 90), figs. 1, 2; scale B (50 µm; × 450), fig. 3.



Stereo-Atlas of Ostracod Shells—Vol. 3, Part I

CONTENTS

3 (1) 1–8	On <i>Renibeyrichia multiciber</i> Siveter gen. et sp. nov.; by David J. Siveter	(£1·40)
3 (2) 9–12	On <i>Philomedes donzei</i> Neale sp. nov.; by J. W. Neale	(£0·70)
3 (3) 13–20	On <i>Centrocypris viridis</i> Neale sp. nov.; by J. W. Neale	(£1·40)
3 (4) 21–28	On <i>Oncocypris pustulosa</i> Gurney; by J. W. Neale	(£1·40)
3 (5) 29–36	On <i>Stenocypris fernandoi</i> Neale sp. nov.; by J. W. Neale	(£1·40)
3 (6) 37–40	On <i>Ilyocypris taprobanensis</i> Neale sp. nov.; by J. W. Neale	(£0·70)
3 (7) 41–44	On <i>Radimella dictyon</i> Pokorný; by R. H. Benson	(£0·70)
3 (8) 45–48	On <i>Radimella darwini</i> Pokorný; by R. H. Benson	(£0·70)
3 (9) 49–52	On <i>Radimella confragosa</i> (Edwards); by R. H. Benson	(£0·70)
3(10) 53–56	On <i>Radimella? aurita</i> (Skogsberg); by R. H. Benson	(£0·70)
3(11) 57–60	On <i>Radimella? floridana</i> (Benson & Coleman); by R. H. Benson	(£0·70)
3(12) 61–64	On <i>Cytherella</i> (<i>Cytherelloidea</i>) <i>petrosa</i> Doruk sp. nov.; by N. Doruk	(£0·70)
3(13) 65–68	On <i>Cytherella</i> (<i>Cytherelloidea</i>) <i>ochthodes</i> Doruk sp. nov.; by N. Doruk	(£0·70)
3(14) 69–72	On <i>Cytherella</i> (<i>Cytherelloidea</i>) <i>chosta</i> Doruk sp. nov.; by N. Doruk	(£0·70)

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